

Self-declared Environmental Claim (UNI ISO EN 14021)



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REVISION STATUS

ED.	Rev.	Date	Edit	Approval	Reason for change	Amended parts
01	00	21-Sept-2023	(.....)	First issue	-

SECTION 01 – INTRODUCTION

I INTRODUCTION

This study was commissioned by CANDIANI SpA, in line with its policies and strategies aimed at reducing the negative environmental impact of its processes and products, and with the goal of:

- identifying a number of objective, relevant, measurable and comparable indicators reflecting the nature of products and processes, as well as the extent of operations;
- assessing the environmental performance of the denim fabrics described in paragraph 5 on the basis of the indicators identified and measured;
- using data to track practices dedicated to environmental management and the effectiveness of the policies and programmes adopted by the senior management team.

I.1 The company

Candiani was founded in 1938 in Robecchetto con Induno, a small town located around 40 km from the centre of Milan. In the 1960s, Candiani became aware of the opportunities that the growing denim market could offer and began a process of transition that transformed it into a vertically integrated company dedicated exclusively to manufacturing denim fabric. In the mid-1980s, Candiani recognised that stretch denim fabric for jeans was not merely a passing trend, and as such, became a pioneer in what has been one of the most significant developments in denim manufacturing in the past 50 years. Now in its fourth generation, with over 300 models and 20,000,000 metres of fabric manufactured every year, Candiani Denim remains a family-owned, family-managed business with the sole objective of combining experience and production capacity with the best in sustainable innovation.

Candiani SpA has implemented an Integrated Management System, and has obtained the following certifications:

- ISO 14001:2015 (Environmental Management) since 2005
- SA 8000:2014 (Corporate Social Accountability) since 2010
- ISO 9001:2015 (Quality Management System) since 2021
- ISO 45001: 2018 (Occupational Health and Safety Management Systems) since 2022

In addition, it also obtained specific Product Certifications in compliance with:

- STANDARD 100 by OEKO-TEX®, since 1996
- GOTS - Global Organic Textile Standard, since 2013
- GRS - Global Recycled Standard, since 2013
- OCS – Organic Content Standard, since 2018
- RCS – Recycled Content Standard, since 2018
- Regenagri® Content Standard certified, since 2021
- Cradle to Cradle Certified® Gold, since 2022

Moreover, Candiani is:

- a BCI – Better Cotton Initiative member as of 2011
- a ZDHC Committed member as of 2017 and Contributor as of 2019
- a Greenpeace Detox Committed member as of 2018
- WORDLY FEM¹ certified, annually verified as of 2018
- WORDLY FSLM² certified, annually verified as of 2021

2 LEGISLATIVE FRAMEWORK OF REFERENCE

Changes pertaining to the environment and to sustainability reporting as part of the EU legislative framework have been taken into account in the assessment of the environmental performance of denim fabrics. Such changes are summarised in the document entitled “**Sustainable products: exceptions to the rules**”³ from March 2022, through which the Commission introduced a package of initiatives related to sustainable products with the overall aim of:

- Ensuring sustainable growth through better use of resources and materials that are utilised in the manufacture of everyday products, as well as improving the products themselves.
- Reducing the energy consumption of products by using them more efficiently and for longer, relying on recycled materials rather than primary raw materials, spreading cutting-edge circular economy models, in order to dissociate economic growth from the usage of natural resource and from environmental degradation.

This initiative is chiefly driven by the **Proposal for an Ecodesign for Sustainable Products Regulation (ESPR)**⁴, as well as by further specific initiatives in the sector such as the **EU Strategy for Sustainable and Circular Textiles**,⁵ whose key actions include the implementation of self-declared environmental claims, giving companies the opportunity to establish and communicate their environmental performance, including with a view to comparing different products.

With regard to this, the indications included in the **proposal for a Directive on substantiation and communication of explicit environmental claims** of last March⁶ were considered – through this directive, the Commission seeks to strengthen consumer protection against misleading and/or false environmental and/or ethical claims (greenwashing) while also making environmental claims reliable, comparable and verifiable.

Finally, it was deemed useful to correlate - as far as possible - the Key Performance Indicators with the indications included in the **Corporate Sustainability Reporting Directive (CSRD)**⁷ concerning company reporting on sustainability. Pertaining to this, **Annex I** includes a table which correlates the Key Performance Indicators (KPIs) used in this study with the specific indicators introduced by the *Global Reporting Initiative (GRI)*, which - as the joint GRI and EFRAG statement shows - has achieved a high level of interoperability between European Sustainability Reporting Standards (ESRS) and GRI Standards⁸.

¹Previously called the HIGG Index

² Ibid.

³ COM (2022), 140 of 30/03/2022

⁴ COM (2022), 142 of 30/03/2022

⁵ COM (2022), 141 of 30/03/2022

⁶ COM (2023), 166 of 22/03/2023

⁷ COM (2023), 2464 of 16/12/2022

⁸ EFRAG-GRI joint statement of interoperability. 5 September 2023

3 TERMS AND DEFINITIONS

Below is a non-exhaustive list of relevant terms included in the claim and in this document.

Terms related to products:

Intermediate product: product that requires a further stage of manufacturing or transformation, such as mixing, coating or assembly, before it is deemed suitable for end users.

Product group: group of products destined for similar purposes and similar usages, or which feature similar functional properties, as well as perceived as similar by consumers.

Terms related to fibres and materials:

Organic cotton: cotton deriving from agricultural companies certified in accordance with the organic farming legislation in force in the country of origin (e.g. EU Regulation 848/2018, NOP, NPOP, etc.).

BCI cotton: cotton grown according to the principles and requirements defined by the Better Cotton Initiative (BCI) so as to minimise the impact of pesticide usage, improve water management, protect the soil and increase soil fertility.

Regenagri cotton: cotton grown and certified according to the requirements of Regenagri standards, which aim to promote the transition towards farming methods that increase soil organic matter and CO₂ capture, foster biodiversity and improve water and energy management.

Preferred fibres: natural textile fibres grown through farming production methods aimed at minimising the impact of pesticide usage, improving water management, protecting the soil and increasing soil fertility. The group includes BCI cotton and Regenagri cotton.

Bio-based products: products entirely or partially composed of materials derived from biomass intended as a material of organic origin and excluding materials derived from carbon or oil (fossil origin).

Recycled material: material derived from recovered material that has undergone reprocessing and has been transformed into a final product or a component to be integrated into a product.

Terms related to ecodesign:

Reliability: probability that a product functions as required under given conditions, for a given duration without limiting events (EN 45552).

Durability: ability to function as required, under given conditions of use, maintenance and repair until a limiting event prevents functioning (EN 45552).

Repair: processes that return a faulty product or waste to a condition where it can fulfil its intended use (EN 45554).

Upgrade: process enhancing the functionality, performance, capacities or aesthetics of a product (EN 45554).

Reuse: process through which a product or its parts, after a first usage, are reused for the same purpose for which they were conceived (EN 45554).

Recycling: any kind of recovery operation through which waste materials are reprocessed into products, materials or substances intended for the original or other purposes and excluding energy recovery (EN 45555).

Lightweight design: reduction of the quantity of materials in a product (or packaging), without compromising its ability to meet minimal functional requirements.

Eco-compatible design: the integration of environmental sustainability considerations in relation to a product's features and the processes undertaken along the entire product value chain.

Declared Unit: quantity of a product utilised as a reference unit in data related to the material, energy and waste entry and exit flows within the system.

SECTION 02 – ECO-SUSTAINABLE DESIGN TARGETS

4 ENVIRONMENTAL TARGETS RELATED TO PRODUCTS

The ecodesign of the denim fabrics assessed by this study aims to improve their environmental profile in terms of the following specific targets:

Specific environmental targets related to products

- a. **Maximise the use of renewable natural textile fibres.**
- b. **Minimise the indirect environmental impact related to cotton cultivation.**
- c. **Maximise the use of safe chemical products** that do not cause harm to human health or the environment.
- d. **Ensure the durability of textile products** made from fabrics while also guaranteeing the best technical performance.
- e. **Ensure the recyclability of textile products** made from fabrics while minimising the presence of components that might affect mechanical recycling processes.
- f. **Ensure the recyclability of packaging material.**
- g. **Reduce the environmental impact of the production process** while enhancing the use of resources and reducing greenhouse gas emissions.

SECTION 03 – PRODUCTS

5 PRODUCTS

5.1 Description of products

The products under assessment are denim fabrics, i.e. robust and compact fabrics made of cotton and in diagonal stripe twill.

Such denim fabrics are categorised according to the CPC (*UN Central Product Classification*) class and sub-class system, as shown below.

UN CPC code

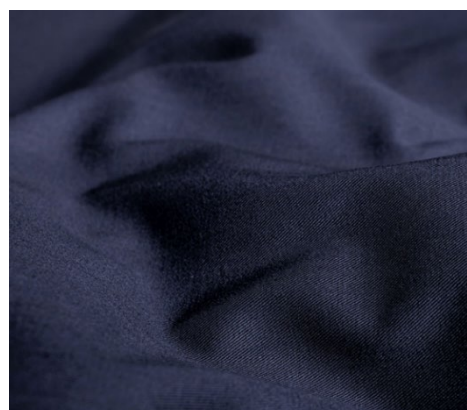
Group	Description	Class	Sub-class	Description
266	Woven fabrics (except special fabrics) of cotton	2662	26620	Woven fabrics of cotton, containing 85% or more by weight of cotton, weighing more than 200 g/m ²

5.2 Fibre composition

The composition of the denim fabrics assessed in this study and their weight per square metre can be found in Table I.

Table I – Composition of ecodesign fabrics

Product		Fibre composition		Weight
Description	Trade name	Description	%	(kg/m ²)
Denim fabric	RR7276OR SIOUX PRESHRUNK	Cotton	100	0.440
Denim fabric	KR8855 K NAVY VIBE RELAST	Cotton	97	0.405
		Elastane	3	
Denim fabric	RR7216OR SIOUX PRESHRUNK	Cotton	98	0.355
		Elastane	2	



SECTION 04 – SYSTEM BOUNDARIES

6 PRODUCTION PROCESS

Candiani SpA is distinguished by a vertically integrated production cycle which begins with the purchase of cotton fibre, and includes all stages required for the manufacturing of fabrics.

More specifically, Candiani's production process features the following aspects, which enable the standardisation of the values of the Key Performance Indicators (KPIs) in accordance with the total mass production:

- the production output is entirely identified as a homogeneous product class, i.e. denim fabrics;
- the production process is essentially the same for all fabrics except for a few differences, mainly involving the finishing operations required by different fabrics;
- the production process includes all required stages for the manufacturing of denim fabrics following ginning, which is considered as the last operation related to the “farming” sector⁹.

Table 2 outlines the stages of the Candiani SpA's production process, together with the plant in which these are carried out.

Table 2 - Production process

Process stage	Description	Management	Plant
Fibre preparation	Yarn spool production	Internal	Candiani UP01, Candiani UP02
Spinning		Internal	Candiani UP01, Candiani UP02
Winding		Internal	Candiani UP01, Candiani UP02
Warping	Thread wound on beams for dyeing	Internal	Candiani UP02
Dyeing	Yarn dyeing	Internal	Candiani UP01
Orthogonal weaving	Parallel yarn weaving (weave/weft)	Internal	Candiani UP01, Candiani UP02
Finishing	Fabric ennobling to define final appearance	Internal	Candiani UP01
Quality control	Defect inspection and measurement	Internal	Candiani UP01

⁹As illustrated by P.J. Wakelyn, from the National Cotton Council (P.J. Wakelyn et al., 2005. “Why Cotton Ginning Is Considered Agriculture”, in *Cotton Gin & Oil Mill Press* 106, 5-9, April 16, 2005), ginning is classified as a farming operation and therefore subject to agricultural legislation.

6.1 Production sites

This study includes the activities undertaken by CANDIANI SpA at its two production sites as shown in Table 3.

Table 3 – General information on production sites

Plant	Address
Candiani UP01	Via Arese 85 Robecchetto con Induno (MI)
Candiani UP02	Via Don Luigi Pozzi 41 Robecchetto con Induno (MI)

Plant UP01 (Figure 1) extends over a total area of 101,420 m² of which: 58,523 m² covered area; 25,307 m² waterproofed uncovered area and 17,540 m² non-waterproofed uncovered area.

Plant UP02 (Figure 2) extends over a total area of 67,000 m² of which: 27,000 m² covered area; 12,000 m² waterproofed uncovered area and 28,000 m² non-waterproofed uncovered area.

Figure 1 – Candiani UP01 plant



Figure 2 – Candiani UP02 plant



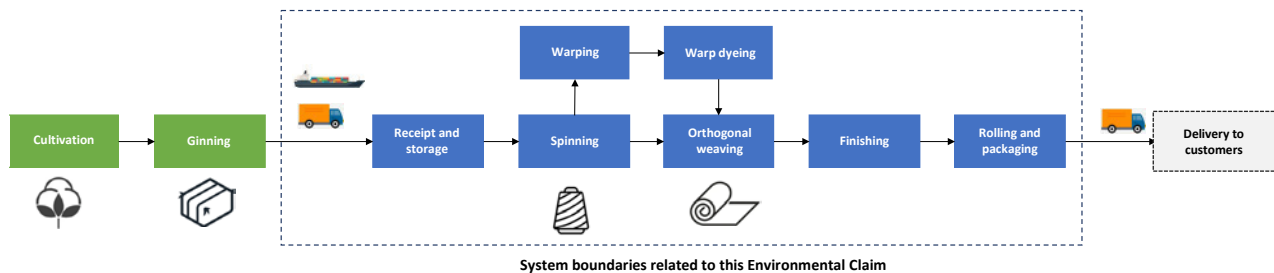
7 SYSTEM BOUNDARIES

The reference system applied to the Environmental Claim, whose boundaries are illustrated in Figure 3, includes the following processes:

- transportation of raw materials** from the production site to the Candiani plant;
- generation of electricity and production of the energy used** for steam production, heating, air conditioning and transportation;
- denim fabric manufacturing processes**, which include:
 - spinning
 - winding
 - warping
 - warp dyeing
 - weaving
 - finishing
 - packaging of the pieces

Transportation of fabrics to the customer has not been included, as fabric is sold ex-works. Moreover, all downstream processes not carried out by Candiani – which include garment making, the distribution and sale thereof, and the use by final consumers – have also not been included.

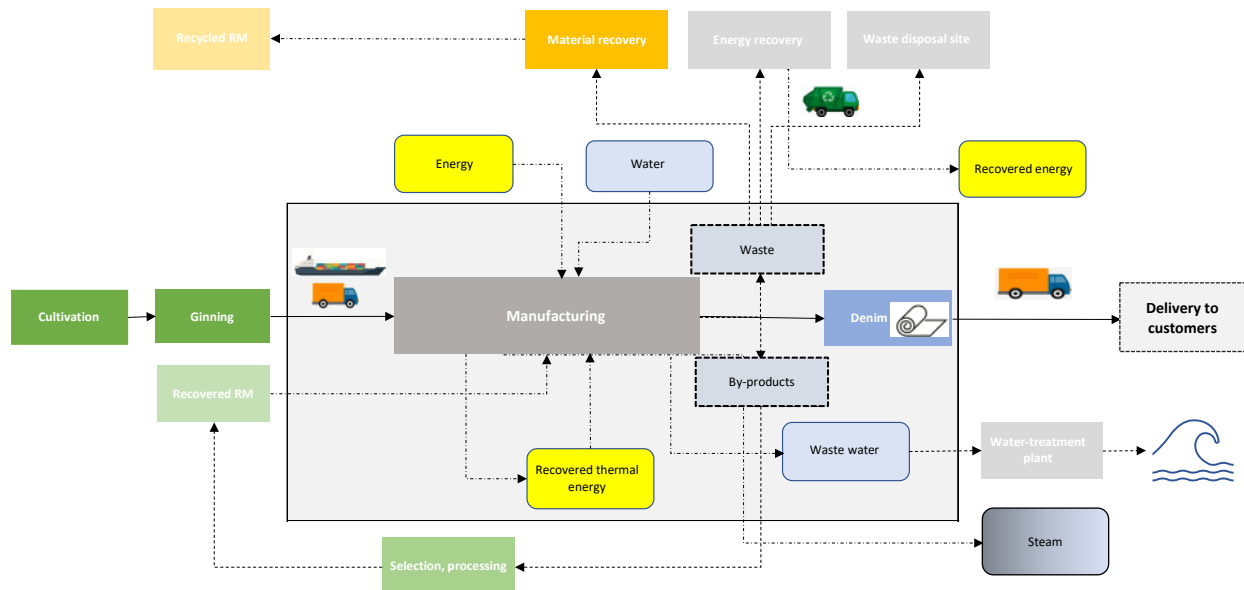
Figure 3 – System boundaries



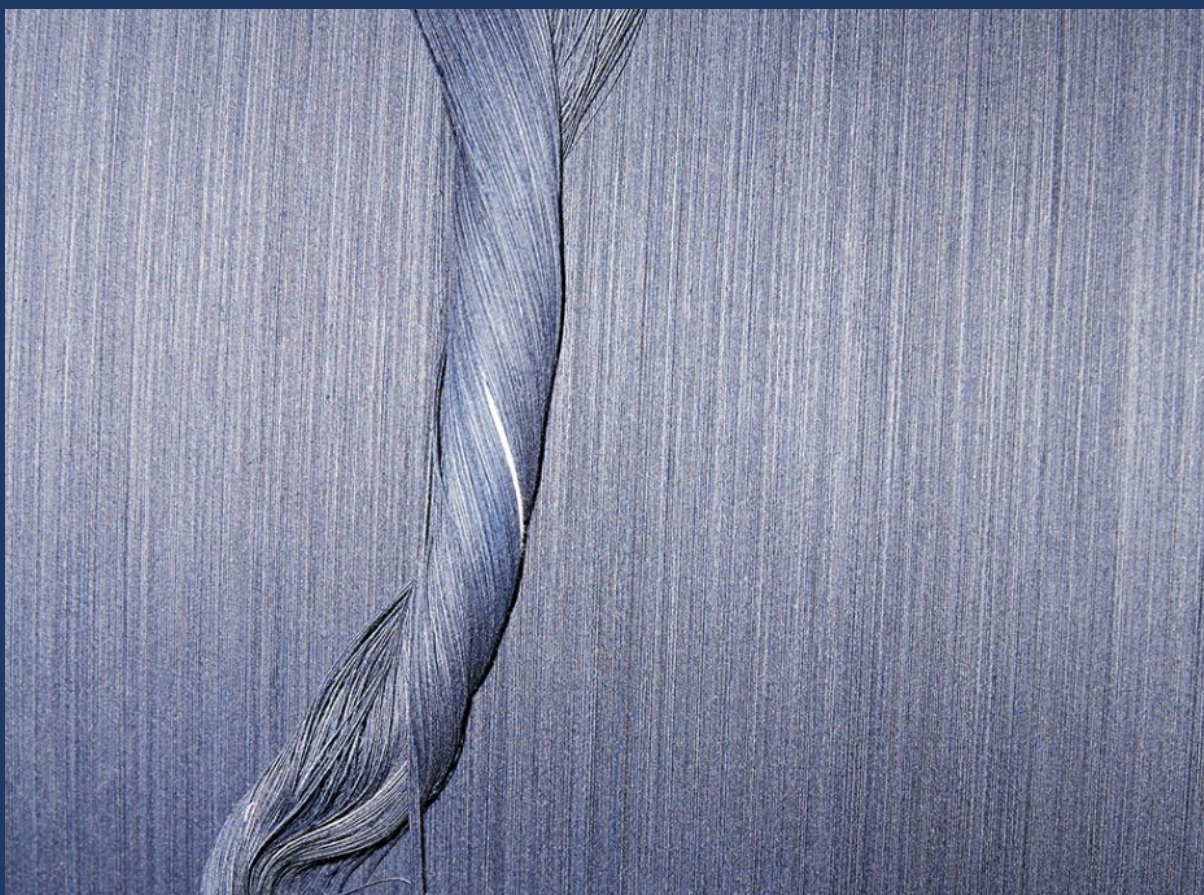
The material and energy flows taken into consideration (Figure 4) include:

- the raw materials that make up the denim fabrics
- the water used in dyeing and finishing processes
- the electricity and thermal energy used in the process
- the by-products and waste derived from the manufacturing process

Figure 4 – Flows taken into consideration in the study



SECTION 05 – ENVIRONMENTAL PROFILE OF PRODUCTS



8 KPIS RELATED TO SPECIFIC PRODUCT CHARACTERISTICS

8.1 Fibrous materials in products

The denim fabrics taken into consideration in this study are made of **over 95% easily renewable natural fibres** (cotton).

Table 4 – Composition characteristics of ecodesign fabrics

Product	Fibre composition				KPI _{Pr}
Trade name	Description	Cat. RM	Sc-RM_1	%	F _{Renew}
RR7276OR SIOUX PRESHRUNK	Cotton	Virgin	Renewable	100	100%
KR8855 K NAVY VIBE RELAST	Cotton	Virgin	Renewable	97	97%
	Elastane	Recycled	Non-renewable	3	
RR7216OR SIOUX PRESHRUNK	Cotton	Virgin	Renewable	98	98%
	Elastane	Virgin	Non-renewable	2	

8.2 Environmental impact from production and extraction of raw materials

The environmental impact of the agricultural stage has been minimised by choosing to use **cotton grown and certified according to the principles and requirements of organic farming as per current legislation** (EU Regulation 848/2018, NOP, NPOP, etc.), which represent 97-100% of the composition of the fabrics considered in this study.

Table 5 – Farming method for natural fibres that make up ecodesign fabrics

Product	Fibre composition				KPI _{Pr}
Trade name	Description	Cat. RM	Sc-RM_1	%	F _{Org}
RR7276OR SIOUX PRESHRUNK	Cotton	Virgin	Renewable	100	100%
KR8855 K NAVY VIBE RELAST	Cotton	Virgin	Renewable	97	97%
	Elastane	Recycled	Non-renewable	3	
RR7216OR SIOUX PRESHRUNK	Cotton	Virgin	Renewable	98	98%
	Elastane	Virgin	Non-renewable	2	

8.3 Durability

Table 6 shows the results of testing carried out on the products assessed in this study, pertaining to degradation mechanisms and functional characteristics deemed as most pertinent and relevant in relation to normal market practices concerning denim fabrics.

Table 6 – Durability measurements

KPI _{Pr}	Reference values	RR7276OR SIOUX PRESHRUNK	KR8855 K NAVY VIBE RELAST	RR7216OR SIOUX PRESHRUNK
	Standard	0.440 g/mq	0.355 g/mq	0.405 g/mq
Abrasion resistance	ISO 12947-2	20000	25000	20000
Tensile strength	ISO 13934-1	Warp 1095N; Weft 715N	Warp 1035N; Weft 356N	Warp 1075N; Weft 519N
Tear resistance	ISO 13937-1	≥ 18N	≥ 18N	≥ 18N
Colour fastness resistance to rubbing	ISO 105 X12	dry 4.5 wet 1.5	dry 4.0 wet 1.0	dry 4.5 wet 1.5
Colour fastness resistance to artificial light	ISO 105 B02	>4	>4	>4
Dimensional stability	ISO 5077	± 2	± 2	± 2

8.4 Recyclability

Recyclability rates for both production waste and garments made with the fabrics considered in this study can be found in the tables below.

It should be stressed that the values pertaining to garments are to be understood as an estimate of recyclability potential, as these are based on the assumption that no further processing is undertaken during the garment manufacturing stage that may compromise the recyclability value of the textile products (for example: coating, bonding, etc.).

Table 7 – Recyclability rate of denim fabrics

Product description	Composition	Recyclability								KPI (Recyclability rate)
		Does the product comply with the specifications and related existing recycling technologies?		Are there any components that may cause recycling issues but which could be mechanically detached?		Are there any non-detachable components that may compromise the recycling process?		If so, is the contaminant quantity < 3%?		
		Yes/No	Verification	Yes/No	Verification	Yes/No	Verification	Yes/No	Verification	
RR7276OR SIOUX PRESHRUNK fabric	100% cotton	Y	Waste collection, sorting, mechanical shredding	N		N		N/A		High
KR8855 K NAVY VIBE RELAST fabric	97% cotton; 3% elastane	Y	Waste collection, sorting, mechanical shredding	N		Y	Elastane	N	3%	Medium-high
RR7216OR SIOUX PRESHRUNK fabric	98% cotton; 2% elastane	Y	Waste collection, sorting, mechanical shredding	N		Y	Elastane	N	2%	Medium-high

Table 8 – Potential recyclability rate of garments

Product description	Composition	Recyclability								KPI (Recyclability rate)
		Does the product comply with the specifications and related existing recycling technologies?		Are there any components that may cause recycling issues but which could be mechanically detached?		Are there any non-detachable components that may compromise the recycling process?		If so, is the contaminant quantity < 3%?		
		Yes/No	Verification	Yes/No	Verification	Yes/No	Verification	Yes/No	Verification	
JEANS made of RR7276OR SIOUX PRESHRUNK	100% cotton	Y	Garment collection, sorting, accessory removal, mechanical shredding	Y	1. Metal parts: zip, buttons, rivets. 2. Labels.	N		N/A		High
JEANS made of KR8855 K NAVY VIBE RELAST	97% cotton; 3% elastane	Y	Garment collection, sorting, accessory removal, mechanical shredding	Y	1. Metal parts: zip, buttons, rivets. 2. Labels.	Y	Elastane	N	3%	Medium-high
JEANS made of RR7216OR SIOUX PRESHRUNK	98% cotton; 2% elastane	Y	Garment collection, sorting, accessory removal, mechanical shredding	Y	1. Metal parts: zip, buttons, rivets. 2. Labels.	Y	Elastane	N	2%	Medium-high

8.5 Recyclability of packaging material

The recyclability rate for the primary packaging material used for fabrics is shown below.

Table 9 – Recyclability rate of primary packaging material

PACKAGING MATERIAL	Component 1		Component 2		Recyclability										KPI Recyclability rate)
	Composition				In the event of multi-component packaging material, can these be easily separated?		Are the materials compliant with common, appropriate and industrially-available recycling technologies?		Do they include any substances or materials that may cause technical issues during the recycling process?		Do they include any substances or materials that these may have a negative impact on the quality of the recycled material?				
	(Material)	%	(Material)	%	Yes/No	Verification	Yes/No	Verification	Yes/No	Verification	Yes/No	Verification			
Tube for rolled-up fabrics	Paper	100			Y	Single material	N/A		Y	COMIECO Consortium - paper collection and recycling	N		N		High
Fabric wrapping film	Polyethylene	100			Y	Single material	N/A		Y	Polieco Consortium - collection and treatment of waste from polyethylene goods	N		N		High

8.6 Recycled content of packaging material components

As a rule, fabrics are wrapped around a tube made of recycled paper and then wrapped in a polyethylene film that, though recyclable, is currently produced using virgin material.

Table 10 – Recycled material content in primary packaging material

PACKAGING MATERIAL	Component 1			KPIs
	(Material)	Type	%	Pack _{rec}
Tube for rolled-up fabrics	Paper	Recycled	100	100%
Fabric wrapping film	Polyethylene	Virgin	100	0%

9 KPIS RELATED TO PRODUCTION PROCESS CHARACTERISTICS

9.1 KPI_{Pr} related to the efficient use of resources

The table below shows the 2022 values related to the quantity of waste per square metre derived from the fabrics considered in this study. Data on waste is also subdivided according to destination (recovery or disposal).

$[KPI_{Pr}]$	RR7276OR	KR8855	RR7216OR
$[r_{tot}]$ quantity of waste from total production (kg/m ²)	0.030	0.027	0.003
$[r_{rec}]$ quantity of waste for recovery from total production (kg/m ²)	0.024	0.022	0.002
$[r_{disp}]$ quantity of waste for disposal from total production (kg/m ²)	0.028	0.025	0.003

9.2 KPIs related to efficient energy usage

The table below shows the 2022 values related to the fabrics considered in this study.

$[KPI_{Pr}]$	RR7276OR	KR8855	RR7216OR
$[E]$ quantity of energy used per m ² of fabric (Mj /m ²)	28.77	23.21	26.48

9.3 KPIs related to the emission of climate-altering gases

The table below shows the 2022 values related to the fabrics considered in this study, also taking into consideration the transportation of textile fibres from the supplier to the Candiani plant.

$[KPI_{Pr}]$	RR7276OR	KR8855	RR7216OR
$[GHG]$ Quantity of climate-altering gases per m ² of fabric (kg CO ₂ eq/m ²)	2.362	1.912	2.179

9.4 KPIs related to efficient water usage

The table below shows the 2022 values related to the fabrics considered in this study.

$[KPI_{Pr}]$	RR7276OR	KR8855	RR7216OR
$[W]$ total quantity of water used per kg of fabric (m ³ /m ²)	0.022	0.017	0.020

SECTION 06 – ORGANISATIONAL ENVIRONMENTAL PERFORMANCE

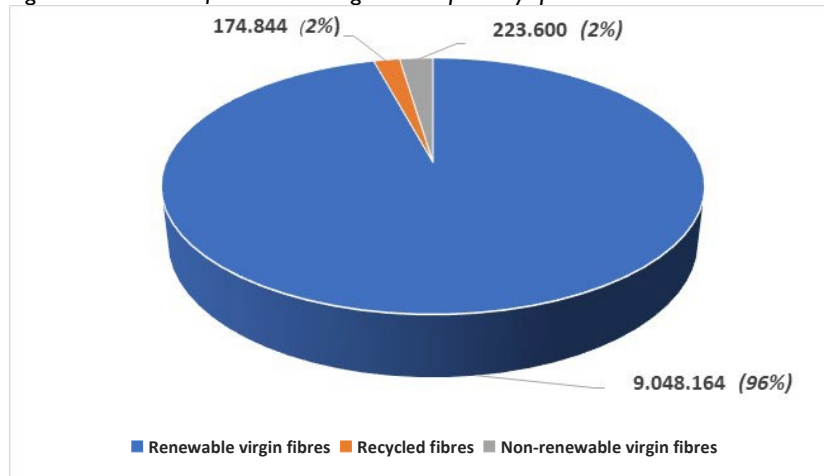


10 KPI_{Org} RELATED TO THE USE OF TEXTILE FIBRES

With regard to virgin fibres used in the production process, the overall consumption in 2022 equalled: **9,446.61 t**, of which **9,048.16 t** are “renewable” virgin fibres and **174.84 t** are recycled textile fibres.

The percentage overall distribution of fibres used out of the total fibres used in 2022 is shown in Figure 5.

Figure 5 - % textile fibres according to their primary qualitative characteristic



KPI _{Org}	2022	Δ (2021)
[F _{Renew}] quantity of renewable virgin textile fibres out of total textile fibres used	95.8%	-11.2%
[F _{Rec}] quantity of recycled textile fibres out of total textile fibres used	1.9%	194.1%

Within the renewable virgin textile fibre group, the “**Preferred fibres**” group (7,093.60 t, equal to 78.40%) is the most quantitatively relevant, and includes:

- **6,532.38 t** of cotton grown using methods with reduced environmental impact in accordance with the principles and requirements of the Better Cotton Initiative (BCI);
- **561.22 t** of cotton grown and certified by the Regenagri standard.

KPI _{Org}	2022	Δ (2021)
[F _{Pref-BCI}] quantity of BCI cotton out of total renewable textile fibres	72.20%	-19%
[F _{Pref-Regen}] quantity of <u>Regenagri</u> cotton out of total renewable textile fibres.	6.20%	N.A.

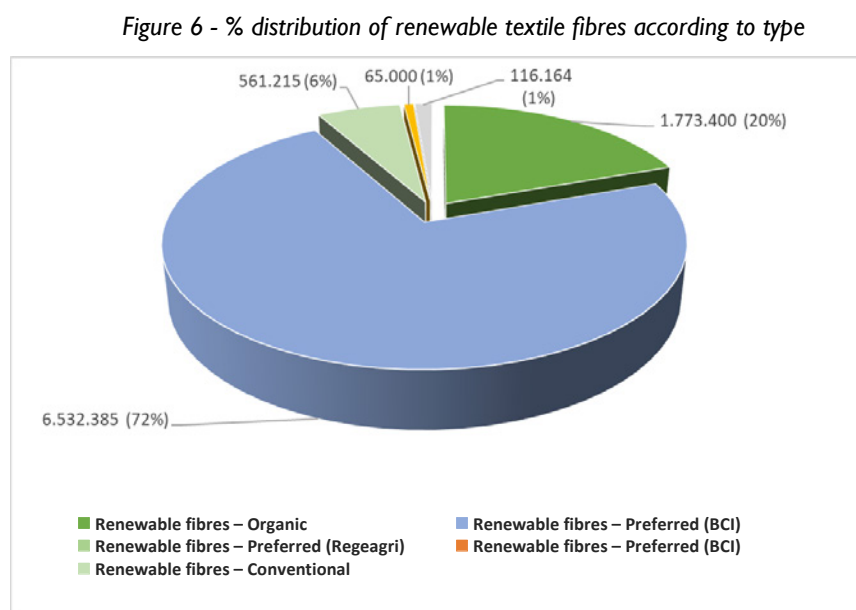
“**Organic fibres**” grown and certified as per current legislation pertaining to organic farming – amounting to **1,773.40 t** used in 2022 and equal to 20% of the purchased cotton total – represent a significant part of the renewable textile fibres employed by Candiani and are evidence of the company's commitment to reducing the environmental impact derived from cotton cultivation.

KPI _{Org}	2022	Δ (2021)
[F _{Org}] quantity of <i>organic cotton</i> out of total renewable textile fibres used in 2022.	19.60%	-12%

“Renewable” fibres also comprise artificial fibres obtained from renewable raw materials, such as cellulose from wood, which are classified as “**bio-based**”. In 2022, **65.40 t** of these were used.

KPI _{Org}	2022	Δ (2021)
[F _{BioB}] quantity of artificial fibres out of total renewable textile fibres used in 2022.	0.70%	=

Figure 6 illustrates the distribution in terms of weight and percentage of the different types of renewable fibres used by Candiani SpA in 2022.



II KPI_{ORG} RELATED TO THE EFFICIENT USE OF RESOURCES

In 2022, the total quantity of waste generated by denim manufacturing amounted to **600,98 t**, of which the vast majority was non-hazardous waste (592,14 t equal to 98.5% of total waste) and in any case by waste destined for recovery (541,11 t equal to 90% of total waste).

The KPIs below relate to waste whose generated quantity has been standardised in accordance with the 2022 total production and then compared with 2021 figures.

The quantity of waste generated in 2022 not only decreased in absolute terms compared to 2021 (621,07 t) but also in relative terms with respect to production, showing a reduction of 5.2% in the quantity of waste generated of the total production quantity.

Waste composition further highlights these positive waste management results, as the quantity of waste for recovery (material or energy) increased by 7% compared to 2021, while the quantity of waste for disposal showed a significant decrease (-53.4%) compared to 2021 figures.

KPI _{org}	2022	Δ (2021)
[r _{tot}] quantity of waste from total production (kg/kg)	0.068	-5.2%
[r _{rec}] quantity of waste for recovery from total production (kg/kg)	0.061	+7.0%
[r _{disp}] quantity of waste for disposal from total production (kg/kg)	0.007	-53.4%

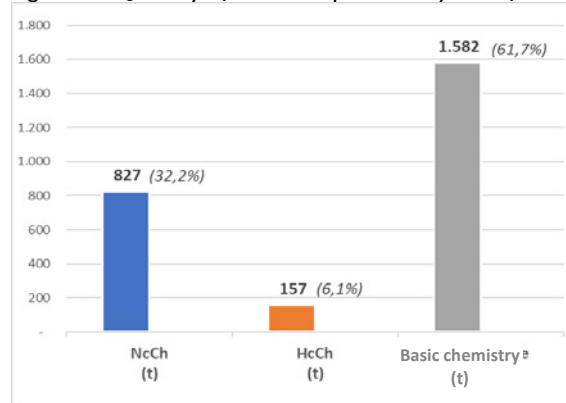
12 KPIS_{ORG} RELATED TO THE USE OF CHEMICAL SUBSTANCES

The denim manufacturing process entails the use of chemical products in the yarn preparation and dyeing stages, as well as in the finishing stage, when the fabric's soft feel and appearance are refined.

The overall quantity of chemical products used in 2022 amounts to **2,565.5 t** of which:

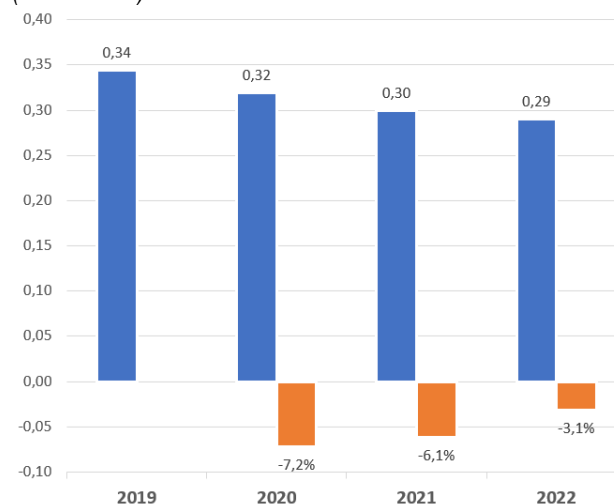
a. Products of no concern , which include:	827 t
- products verified and approved as per ZDHC MRSL standards	(688 t)
- products whose Safety Data Sheet does not include hazard indications	(139 t)
b. Products of concern (Safety Data Sheet includes hazard indications)	157 t
c. Basic chemistry products (e.g. acids, hydrogen peroxide, caustic soda)	1,582 t

Figure 7 - Quantity of chemical products by classification



With regard to the quantity of chemical products used in relation to total production, in 2022 this amounted to **0.29 kg** of chemical products per kg of fabric, a quantity that – as highlighted in Figure 8, where the blue bars correspond to the use of chemical products per kg of fabric and the orange bars to the annual percentage variation – showed a continuous decline down to **-15.6%** over the 2019-2022 period.

Figure 8 - usage intensity of chemical products per kg of fabric (2019-2022)



KPI _{org}	2022	Δ (2021)
[Ch] quantity of chemical products per kg of fabric (kg)	0.29	-3.1%
[NcCh] quantity of chemical products of no concern per kg of fabric (kg)	0.09	-22.2%
[HcCh] quantity of chemical products of concern per kg of fabric (kg)	0.02	-9.6%

13 KPI_{ORG} RELATED TO THE EFFICIENT USE OF ENERGY

Energy consumption includes purchased and imported electricity, the methane used in stationary heating and steam-production systems and, lastly, the fuel (diesel) used for internal transportation between the two plants.

Consumption values have been converted into both tonnes of oil equivalent (TOE) – using the conversion factors adopted by FIRE (Italian Federation for Energy Efficiency) as per point 13 in the explanatory note included in the MISE (Italian Ministry of Enterprises and Made in Italy) memo of 18 December 2014 – and into GJ (see Table 18).

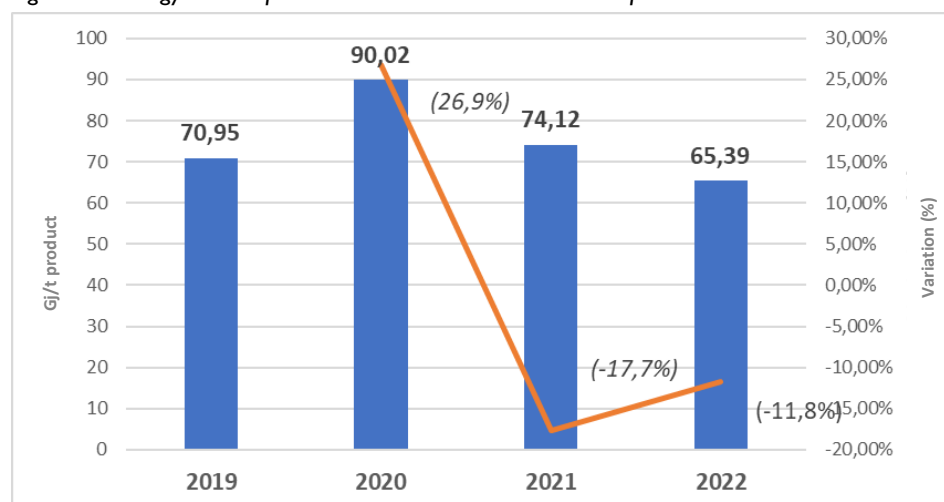
Table 18 - Energy consumption (2022)

Energy consumption	Unit of measurement	TOE conversion factor	1 t TOE/GJ conversion factor	2022	Quantities in TOE	Quantities in GJ
Electricity consumption	GWh	0.187	41.868	47,970	8,970	375,569
Methane	Sm ³	0.000836		5,760,835	4,816	201,639
Diesel for transportation	l	0.00086		8,300	7	299
TOTAL Energy usage (TOE and Gj)					13,794	577,506

KPI _{Org}	2022	Δ (2021)
[E] quantity of energy used per kg of fabric (Mj/kg)	65.39	-11.8%

The 2022 consumption standardised according to total production was of 65.39 MJ – a significant reduction compared to 2021 figures (-11.8%), which already showed a decrease of -17.7% over 2020 consumption (see Figure 9), though these figures were influenced by the dramatic fall in production caused by the COVID-19 pandemic.

Figure 9 - Energy consumption variation over the 2019-2022 period



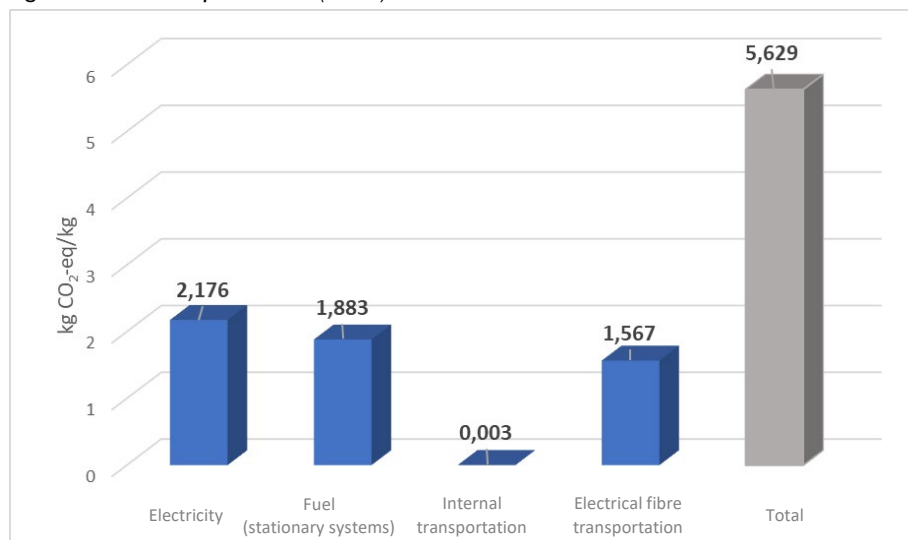
I4 KPI_{ORG} RELATED TO CLIMATE-ALTERING GASES

As regards greenhouse gas emissions from the 2022 total production, these amounted to 5.629 kg CO₂-eq per 1 kg of denim fabric and showed a reduction of 6.6% compared to 2021.

KPI _{ORG}	2022	Δ (2021)
[GHG] Quantity of climate-altering gases per kg of fabric (kg CO ₂ eq/kg)	5.63	-6.6%

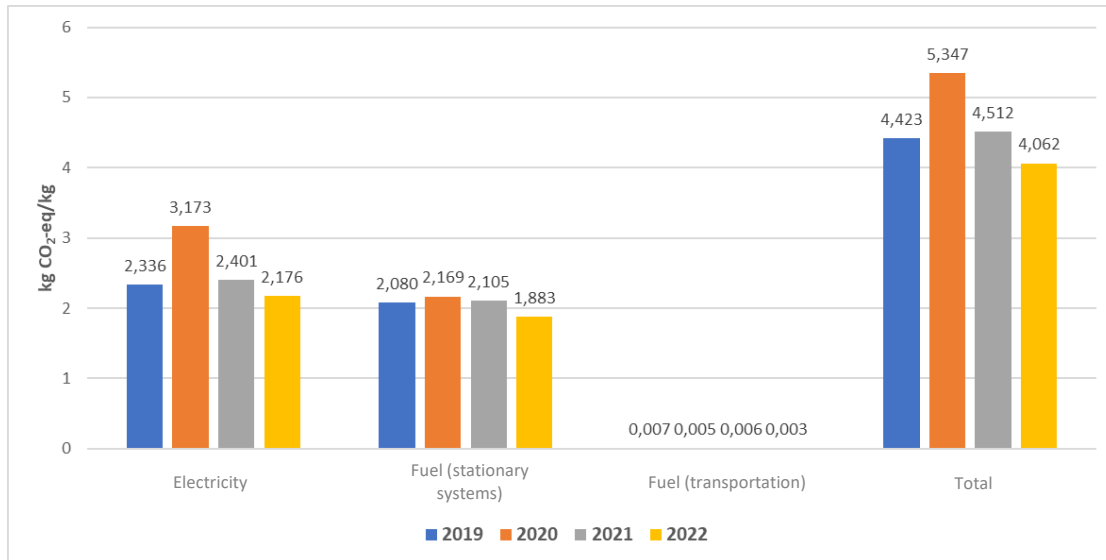
Out of these, 38.75 (= 1%) are derived from electricity usage, while the natural gas used in stationary systems amounted to 33.5%. The amount generated by the transportation of textile fibres was also significant and, overall, represented 27.8% of the total. The amount related to Candiani's use of its own vehicles to transport raw materials and products between the two plants, however, decreased significantly and amounted to 0.1% of total emissions (see Figure 10).

Figure 10 – CO₂-eq emissions (2022)



Looking at the incidence of the values related to 2019-2022 emissions, not including the amount deriving from the transportation of fibres – so as to solely assess contributions directly associated with internal production and energy consumption in the Candiani plants – a steady decrease can be noticed, which in 2022 amounted to 10% over the previous year (Figure 11).

Figure 11 – CO₂-eq emissions over the 2019-2022 period

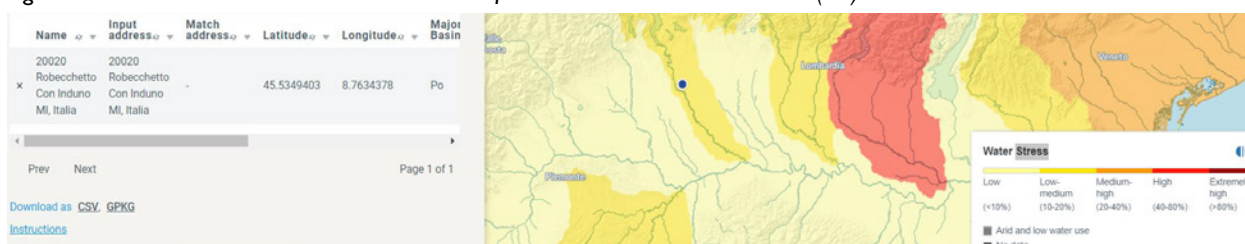


15 KPI_{ORG} RELATED TO EFFICIENT WATER USAGE

When assessing water usage, the risk of water shortage in relation to the specific geographical area where Candiani's manufacturing plants are located has been prioritised.

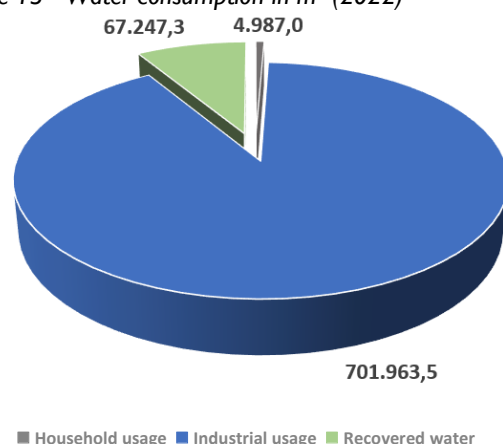
For this purpose, the “Aqueduct Tool” by the World Resources Institute (<https://www.wri.org/data/aqueduct-water-risk-atlas>) was used to establish the area criticality ratio in relation to the use of water resources according to the “Water stress” indicator¹⁰. The analysis highlighted in Figure 12 shows that the plants are located in an area with currently medium-low values of water stress.

Figure 12 - “Water stress” indicator assessment for the Robecchetto con Induno (MI) area



Overall water consumption in 2022 amounted to **774,197.8 m³** of which **67,247.3 m³** (equal to **11.4%** of total consumption) was derived from **water recovery** achieved via a recovery system collecting the raw water used in sanforising machines as well as via the recovery of steam condensation from dyeing and finishing processes.

Figure 13 - Water consumption in m³ (2022)



“Water use intensity” (W) – which also includes the amount of waste water processed by the water-treatment plant that, once organic and inorganic pollutants have been removed, is discharged into superficial water bodies – amounted to 0.049 m³/kg, 2.4% higher than 2021 (0.048 m³/kg).

KPI _{ORG}	2022	Δ (2021)
[W] total quantity of water used per kg of fabric (m ³ /kg)	0.049	2.4%

¹⁰“Water stress” measures the ratio between total water withdrawal and the supplies of renewable surface and underground water resources available. Water withdrawal includes domestic, industrial and irrigation use, as well as water for cattle bred for consumption and non-consumption. Higher values indicate higher competitive usage by users.

ANNEX I – KPI-GRI CORRELATION

Environmental aspect	KPIs	Global Reporting Initiative (GRI)					ID_2	Disclosure description	ID_2	Disclosure description
		Abbrevia- tion	Description	Type	UoM					
Use of resources (resource depletion)	Renewal content	F_{Renew}	Quantity of renewable natural textile fibres out of total composition	Quantitative	[%]		301-2	Materials used by weight or volume		
Land use	Organic fibres content rate	F_{org}	Quantity of fibres from certified organic farming out of total natural fibres	Quantitative	[%]					
Use of resources (resource depletion)	Recycled fibres content rate	F_{rec}	Quantity of recycled fibres out of total composition	Quantitative	[%]		301-2	Recycled input materials used		
Use of resources (resource depletion)	Biobased fibres content rate	F_{biob}	Quantity of "biobased" fibres out of total composition	Quantitative	[%]					
Use of resources (resource depletion)	Durability	DU	Resistance and durability testing – values not lower than "good"	Quantitative	Test grade					
Use of resources (resource depletion)	Recyclability (product)	$Prod_{rec}$	Recyclability rate in relation to available recycling material technologies	Semi-qualitative						
Use of resources (resource depletion)	Recyclability (packaging)	$Pack_{rec}$	Recyclability rate in relation to available recycling material technologies	Semi-qualitative						
Use of resources (generation of waste)	Total waste generated	r_{tot}	Total quantity of waste generated	Quantitative	[t]		306-3	Waste generated		
Use of resources (generation of waste)	Total waste recovered	r_{rec}	Total quantity of waste for recovery	Quantitative	[t]		306-4-a	Total weight of waste diverted from disposal		
Use of resources (generation of waste)	Total hazardous waste - recycling	$r_{hwh-rec}$	Total quantity of hazardous waste for recycling	Quantitative	[t]		306-4-b.ii	Total weight of hazardous waste for recycling		
Use of resources (generation of waste)	Total hazardous waste - other recovery	$r_{hwh-ot-rec}$	Total quantity of hazardous waste for other types of recovery	Quantitative	[t]		306-4-b.iii	Total weight of hazardous waste for other types of recovery		
Use of resources (generation of waste)	Total non-hazardous wastes - recycling	$r_{nhwh-rec}$	Total quantity of non-hazardous waste for recycling	Quantitative	[t]		306-4-c.ii	Total weight of non-hazardous waste for recycling		
Use of resources (generation of waste)	Total non-hazardous waste - other types of recovery	$r_{nhwh-ot-rec}$	Total quantity of non-hazardous waste for other types of recovery	Quantitative	[t]		306-4-c.ii	Total weight of non-hazardous waste for other types of recovery		
Use of resources (generation of waste)	Total waste disposed	r_{dis}	Total quantity of waste for disposal	Quantitative	[t]		306-5-a	Total weight of waste for disposal		
Use of resources (generation of waste)	Total hazardous waste - incineration	$r_{hwh-inc}$	Total quantity of hazardous waste for incineration	Quantitative	[t]		306-5-b.i	Total weight of hazardous waste for incineration (with energy recovery)		
Use of resources (generation of waste)	Total hazardous waste disposed	$r_{hwh-lan}$	Total quantity of hazardous waste for disposal	Quantitative	[t]		306-5-b.iii	Total weight of hazardous waste for landfill	306-5-b	Total weight of hazardous waste for other types of disposal
Use of resources (generation of waste)	Total hazardous waste - other types of disposal	$r_{hwh-ot-dis}$	Total quantity of hazardous waste for other types of disposal	Quantitative	[t]		306-5-b.iv	Total weight of hazardous waste for other types of disposal		
Use of resources (generation of waste)	Total non-hazardous waste for energy recovery	$r_{nhwh-inc}$	Total quantity of non-hazardous waste for incineration	Quantitative	[t]		306-5-c.i	Total weight of non-hazardous waste for incineration (with energy recovery)		
Use of resources (generation of waste)	Total non-hazardous waste - other types of recovery	$r_{nhwh-ot-rec}$	Total quantity of non-hazardous waste for other types of recovery	Quantitative	[t]		306-5-c.iii	Total weight of non-hazardous waste for landfill		
Use of resources (generation of waste)	Total non-hazardous waste - other types of disposal	$r_{nhwh-ot-dis}$	Total quantity of non-hazardous waste for other types of disposal	Quantitative	[t]		306-5-b.iv	Total weight of hazardous waste for other types of disposal		
Use of resources (generation of waste)	Waste (recovered residual rate)	r_{rec}	Quantity of waste destined for recovery out of production total	Quantitative	[kg/m ²]					
Use of resources (generation of waste)	Waste (disposed residual rate)	r_{disp}	Quantity of waste for disposal out of production total	Quantitative	[kg/m ²]					


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ANNEX 2 – KPIS RELATED TO PRODUCTION TOTAL


Environmental aspect	KPIs		Description	Type	UoM	2022	Var.	
	KPIs	Abbreviation						
Use of resources (resource depletion)	Renewal content	F _{Renew}	Quantity of renewable natural textile fibres out of total composition	Quantitative	[%]	95.8%	-11.2%	
Use of resources (resource depletion)	Recycled fibres content rate	F _{Rec}	Quantity of recycled fibres out of total composition	Quantitative	[%]	1.9%	194%	
Use of resources (resource depletion)	Biobased fibres content rate	F _{biob}	Quantity of "biobased" fibres out of total composition	Quantitative	[%]	0.7%	=	
Land use	Organic fibres content rate	F _{Org}	Quantity of fibres from certified organic farming out of total natural fibres	Quantitative	[%]	19.6%	-12%	
Land use	Preferred fibres content rate	F _{Pref-BCI}	Quantity of BCI cotton of total renewable textile fibres	Quantitative	[%]	72.2%	-19%	
Land use	Preferred fibres content rate	F _{Pref-Regen}	Quantity of Regenagri cotton of total renewable textile fibres	Quantitative	[%]	6.2%	N.A.	
Use of resources (generation of waste)	Waste (total residual rate)	r _{tot}	Quantity of waste out of production total	Quantitative	[kg/kg]	0.068	-5.2%	
Use of resources (generation of waste)	Waste (recovered residual rate)	r _{rec}	Quantity of waste destined for recovery out of production total	Quantitative	[kg/kg]	0.061	7.0%	
Use of resources (generation of waste)	Waste (disposed residual rate)	r _{disp}	Quantity of waste for disposal out of production total	Quantitative	[kg/kg]	0.007	-53.4%	
Use of resources (use of substances of concern)	Chemical products use intensity	Ch	Total quantity of chemical products used out of production total	Quantitative	[kg/kg]	0.29	-3.1%	
Use of resources (use of substances of concern)	Non-highly concerning chemical products rate	NcCh	Total quantity of chemical products of no concern used out of production total	Quantitative	[kg/kg]	0.09	-22.2%	
Use of resources (use of substances of concern)	Highly concerning chemicals rate	HcCh	Total quantity of chemical products of concern used in total production	Quantitative	[kg/kg]	0.02	-9.6%	
Use of resources (use of energy)	Energy use intensity	E	Quantity of energy used out of production total	Quantitative	[MJ/kg]	65.39	-11.8%	
Use of resources (use of energy)	Renewable energy use intensity	RE	Quantity of renewable energy used out of production total	Quantitative	[MJ/kg]	---	---	
Use of resources (use of water)	Water use intensity	W	Total quantity of water used out of production total	Quantitative	[m3/kg]	0.049	2.4%	
Climate changes	GHGs intensity	GHG	Quantity of climate-altering gases emissions out of production total	Quantitative	[CO2eq/kg]	5.63	-6.6%	


ANNEX 3.1 - RR7276OR SIOUX PRESHRUNK ENVIRONMENTAL PROFILE


Candiani DENIM		[ECO-Pass 01]			Rev. 00 21-Sept-2023
Product		Fibre composition			Weight
Type	Trade name	Description	Feature	%	(kg/m ²)
Denim fabric	RR7276OR SIOUX PRESHRUNK	Cotton	Organic	100	0,440


	Resource depletion			
	KPIs	Description	UoM	Value
	Renewal content	F _{Renew}	[%]	100%
	Organic fibres content rate	F _{org} Quantity of fibres derived from organic farming of total natural fibres	[%]	100%
	Durability	DU Abrasion resistance		20000
		Tensile strength		Warp 1095N; Weft 715N
		Tear resistance		≥ 18N
		Colour fastness resistance to rubbing		dry 4.5 wet 1.5
		Colour fastness resistance to artificial light		>4
		Dimensional stability		± 2
	Recyclability (product)	Prod _{rec} Recyclability rate in relation to available recycling technologies		High
	Recyclability (packaging)	Pack _{rec} Recyclability rate in relation to available recycling technologies		High

	Generation of waste			
	KPIs	Description	UoM	Value
	Waste (total residual rate)	r _{tot} Quantity of waste out of production total	[kg/m ²]	0,030
	Waste (recovered residual rate)	r _{rec} Quantity of waste destined for recovery out of production total	[kg/m ²]	0,027
	Waste (disposed residual rate)	r _{disp} Quantity of waste for disposal out of production total	[kg/m ²]	0,003

	Use of substances of concern			
	KPIs	Description	UoM	Value
	Chemical products use intensity	Ch Total quantity of chemical products used out of production total	[kg/kg]	0,29
	Non-highly concerning chemical products rate	NcCh Total quantity of chemical products of no concern used out of production total	[kg/kg]	0,09
	Highly concerning chemicals rate	HcCh Total quantity of chemical products of concern out of production total	[kg/kg]	0,02

	Use of energy			
	KPIs	Description	UoM	Value
	Energy use intensity	E Quantity of energy used out of production total	[MJ/m ²]	28,77
	Renewable energy use intensity	RE Quantity of renewable energy used out of production total	[MJ/m ²]	---

	Use of water			
	KPIs	Description	UoM	Value
	Water use intensity	W Total quantity of water used out of production total	[m ³ /m ²]	0,022

	Climate change			
	KPIs	Description	UoM	Value
	GHGs intensity	GHG Quantity of climate-altering gases emissions out of production total	[CO ₂ eq]	2,362

ANNEX 3.2 - KR8855 K NAVY VIBE RELAST ENVIRONMENTAL PROFILE

Product		Fibre composition			Weight
Type	Trade name	Description	Feature	%	(kg/m ²)
Denim fabric	KR8855 K NAVY VIBE RELAST	Cotton	Organic	97	0,355
		Elastane	Recycled	3	

Resource depletion				
KPIs	Description		UoM	Value
Renewal content	F _{Renew}	Quantity of renewable natural textile fibres out of total composition	[%]	97%
Organic fibres content rate	F _{org}	Quantity of fibres derived from organic farming of total natural fibres	[%]	100%
Durability	DU	Abrasion resistance		25000
		Tensile strength		Warp 1035N; Weft 356N
		Tear resistance		≥ 18N
		Colour fastness resistance to rubbing		dry 4.0 wet 1.0
		Colour fastness resistance to artificial light		>4
		Dimensional stability		± 2
Recyclability (product)	Prod _{rec}	Recyclability rate in relation to available recycling technologies		Medium-high
Recyclability (packaging)	Pack _{rec}	Recyclability rate in relation to available recycling technologies		High

Generation of waste				
KPIs	Description		UoM	Value
Waste (total residual rate)	r _{tot}	Quantity of waste out of production total	[kg/m ²]	0,024
Waste (recovered residual rate)	r _{rec}	Quantity of waste destined for recovery out of production total	[kg/m ²]	0,022
Waste (disposed residual rate)	r _{disp}	Quantity of waste for disposal out of production total	[kg/m ²]	0,002

Use of substances of concern				
KPIs	Description		UoM	Value
Chemical products use intensity	Ch	Total quantity of chemical products used out of production total	[kg/kg]	0,29
Non-highly concerning chemical products rate	NcCh	Total quantity of chemical products of no concern used out of production total	[kg/kg]	0,09
Highly concerning chemicals rate	HcCh	Total quantity of chemical products of concern out of production total	[kg/kg]	0,02

Use of energy				
KPIs	Description		UoM	Value
Energy use intensity	E	Quantity of energy used out of production total	[MJ/m ²]	23,21
Renewable energy use intensity	RE	Quantity of renewable energy used out of production total	[MJ/m ²]	---

Use of water				
KPIs	Description		UoM	Value
Water use intensity	W	Total quantity of water used out of production total	[m3/m ²]	0,017

Climate change				
KPIs	Description		UoM	Value
GHGs intensity	GHG	Quantity of climate-altering gases emissions out of production total	[CO2eq]	1,912

ANNEX 3.3 - RR7276OR SIOUX PRESHRUNK ENVIRONMENTAL PROFILE

Product		Fibre composition			Weight
Type	Trade name	Description	Feature	%	(kg/m ²)
Denim fabric	RR7216OR SIOUX PRESHRUNK	Cotton	Organic	98	0,405
		Elastane	Recycled	2	

Resource depletion				
	KPIs	Description		Value
	Renewal content	F _{Renew}	Quantity of renewable natural textile fibres out of total composition	98%
	Organic fibres content rate	F _{Org}	Quantity of fibres derived from organic farming of total natural fibres	100%
	Durability	DU	Abrasion resistance	20000
			Tensile strength	Warp 1075N; Weft 519N
			Tear resistance	≥ 18N
			Colour fastness resistance to rubbing	dry 4.5 wet 1.5
			Colour fastness resistance to artificial light	>4
			Dimensional stability	± 2
	Recyclability (product)	Prod _{rec}	Recyclability rate in relation to available recycling technologies	Medium-high
	Recyclability (packaging)	Pack _{rec}	Recyclability rate in relation to available recycling technologies	High

Generation of waste				
	KPIs	Description		Value
	Waste (total residual rate)	r _{tot}	Quantity of waste out of production total	0,028
	Waste (recovered residual rate)	r _{rec}	Quantity of waste destined for recovery out of production total	0,025
	Waste (disposed residual rate)	r _{disp}	Quantity of waste for disposal out of production total	0,003

Use of substances of concern				
	KPIs	Description		Value
	Chemical products use intensity	Ch	Total quantity of chemical products used out of production total	0,29
	Non-highly concerning chemical products rate	NcCh	Total quantity of chemical products of no concern used out of production total	0,09
	Highly concerning chemicals rate	HcCh	Total quantity of chemical products of concern out of production total	0,02

Use of energy				
	KPIs	Description		Value
	Energy use intensity	E	Quantity of energy used out of production total	26,48
	Renewable energy use intensity	RE	Quantity of renewable energy used out of production total	---

Use of water				
	KPIs	Description		Value
	Water use intensity	W	Total quantity of water used out of production total	0,02

Climate change				
	KPIs	Description		Value
	GHGs intensity	GHG	Quantity of climate-altering gases emissions out of production total	2,179