

EPD – Environmental Product Declaration.

In accordance with ISO 14025 for: High Vis Green waistcoat class 2 5067 GPLU and High Vis waistcoat class 2 5013 PLU

General information

Owner of the EPD:

Fristads AB Prognosgatan 24, 501 11 Borås, Sweden
Contact person: Lene Jul, Product management director,
lene.jul@fristads.com
www.fristads.com

Location of production site:

Laos and Ukraine

Programme:	The international EPD [®] system www.environdec.com
Programme operator:	EPD international AB
EPD registration number:	S-P-03879
Publication date:	2021-09-01
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Geographical scope:	Global
Prepared with the assistance of Rise AB.	



The world's first environmentally declared high-visibility garments.

A green revolution.

Fristads Green is a concept of workwear where the entire manufacturing chain is characterized by environmental awareness and innovation to minimize the footprint on the environment.

Committed to sustainability.

In 2019 Fristads became the first clothing producer in the world to introduce a new standard for measuring the total environmental impact of a garment – from choice of material to delivery of the finished garment.

With three own factories in Europe and sales in more than 20 countries, there are many people around the world working for us – and we care for each and every one of them. These are fine words of course, and we stand firmly behind them. Injustices, unreasonable working hours, low wages, corruption – these are all issues that we resist, where we are constantly on our guard. We work hard to exert our influence wherever our products are made.

We have set high requirements for the companies that want to be our suppliers, at all stages. We give consideration to all the details in the chain, from human rights to environmental impact. It's our duty.

Our work with sustainability is based on the 10 principles in the UN's Global Compact, which forms the basis for our Code of Conduct. We respect and promote human rights according to the United Nations Declaration of Human rights and the Core Conventions of the International Labour Organisation. As a member of amfori BSCI (Business Social Compliance Initiative), we pursue a constructive and open dialogue among our business partners and stakeholders to reinforce the principles of a socially responsible business.

We are certified according to ISO 14001 and work constantly to improve our environmental performance. We monitor the use of chemicals in our products throughout our supply chain. Our Restricted Substance List, shared among all suppliers, reflects the latest EU harmonized legislation which includes REACH, pops regulation, Biocide Regulation and Product Safety Regulation, and is updated regularly based on the guidance of our partner RISE, the Swedish Chemical Group. Furthermore, most of our products are OEKO-TEX® certified.

These efforts are rarely visible from the outside. But, we know they make a difference. For this reason, they are extremely important for us as we strive to make a better world to live in, a world we can proudly leave for the generations that follow us.

Read more at fristads.com.



Human rights, labour, environment, anti-corruption



Social compliance



Environment



Chemical regulations

"It is easy to say that a product is produced in a sustainable way, but without objective, verifiable data, the claim falls flat".



Fristads aims to contribute to positive change and greater transparency when it comes to environmental impact.

Garments with care for the future.

EPD

Environmental Product Declaration

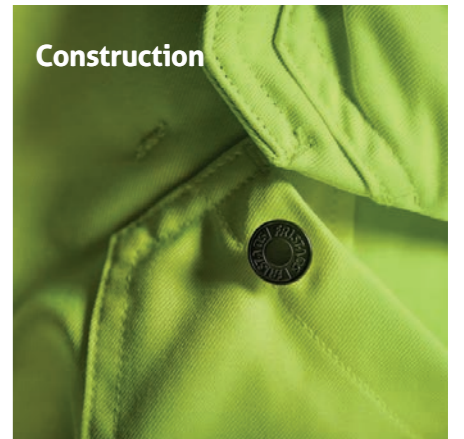
"A long-term, sustainable and transparent measuring tool for environmental impact".

- Fristads is the first clothing producer in the world to introduce a new standard for measuring the total environmental impact of a garment – from choice of material to delivery of the finished garment
- A standard can be used throughout the textile industry
- The EPD measures the impact in four main areas: material, construction, production and delivery

An Environmental Product Declaration (EPD) is an independently verified and registered document that communicates transparent and comparable information about the life cycle environmental impact of products. The relevant standard for Environmental Product Declarations is ISO 14025, where they are referred to as "Type III environmental declarations". A Type III environmental declaration is created and registered in the framework of a programme, such as the International EPD® System.

The International EPD® System has, as a main objective, the ambition to enable and support organisations in any country to communicate quantified environmental information on the life cycle of their products in a credible, comparable, and understandable way. All EPDs registered in the International EPD® System are publically available and free to download on this website: www.environdec.com.

All EPDs are based on Product Category Rules providing rules, requirements, and guidelines for a defined product category. The overall goal of an EPD is to provide relevant and verified information to meet the communication needs in the various applications: procurement, ecodesign or environmental management systems. An important aspect of EPD is to provide the basis of a fair comparison of products and services by its environmental performance. EPDs can reflect the continuous environmental improvement of products and services over time and are able to communicate and add up relevant environmental information along a product's supply chain.



High-visibility waistcoats with an EPD.

Garment name	Art no	Description	
High Vis Green waistcoat class 2 5067 GPLU	134242	Green collection	See below
High Vis waistcoat class 2 5013 PLU	131155	Conventional collection	See below

The High Vis Green waistcoat 5067 GPLU and the High Vis waistcoat 5013 PLU are both constructed from a main fabric made of polyester and cotton.



HIGH VIS GREEN WAISTCOAT CLASS 2 5067 GPLU

Article no 134242

Part of Fristads Green collection / Sustainable / Front placket opening with zip to top of collar and snap fastening / Chest pocket with zip and inside ID-card holder / Chest pocket with vertical zip / 2 front pockets with zip / Adjustable waist with buttons / Extended back / Approved according to EN ISO 20471 class 2 and EN 13758-2 UPF 40+ Solar UV Protective Properties. Colour 230 is approved according to RIS-3279-TOM issue 1 UK Railway Standard / Approved after 50 washes / Leasing-laundry tested according to ISO 15797 / With EPD (Environmental Product Declaration) / OEKO-TEX® certified.

MATERIAL 70% recycled polyester, 30% organic cotton. **WEIGHT** 240 g/m². **COLOUR** 130 Hi-Vis Yellow, 230 Hi-Vis Orange. **SIZE** S-5XL.



HIGH VIS WAISTCOAT CLASS 2 5013 PLU

Article no 131155

Front placket opening with zip to top of collar and snap fastening / Reflective detailing on shoulders / 1 bellowed chest pocket with flap and snap fastening, D-ring, ID card holder and penstrap / 1 chest pocket with flap and vertical zip / 2 front pocket with zip / Adjustable waist with snap fastening / Approved according to EN ISO 20471 class 2 / Approved after 50 washes / Leasing laundry-tested according to ISO 15797 / With EPD (Environmental Product Declaration) / OEKO-TEX® certified.

MATERIAL 80% polyester, 20% cotton. **WEIGHT** 300 g/m². **COLOUR** 130 Hi-Vis Yellow, 230 Hi-Vis Orange. **SIZE** XS-3XL.

The sustainable choice

High Vis Green waistcoat class 2 5067 GPLU.



- Fabric made of recycled polyester and organic cotton
- All zippers are made of 100% recycled polyester, with the exception of the zip pullers
- The design utilises that the front zipper can be easily replaced if it breaks in order to prolong the life of the garment
- Product label and inside size label are made of 100% recycled polyester
- Product label and inside size label are made of 100% recycled polyester
- Pin for hangtag and norm books is made of 100% PBS (biodegradable polybutylene succinate). Norm books and hangtag are printed on sustainable paper made of FSC (The Forest Stewardship Council™) certified/recycled wood
- Packed in plastic bags made from 100% LDPE (low density polyethylene)
- All surplus material from production is utilised on site and turned into new products like e.g. mattressfilling

LCA information – Life cycle assessment.

Life Cycle Assessment is a method for analysing the environmental impact of a product throughout its life-cycle, from the extraction of raw materials (the cradle) to handling the waste (the grave).

Goal of the study

An LCA study has been conducted in accordance with ISO 14044 and the requirements stated in the General Programme Instructions by The International EPD® System¹. goal of the present LCA study has been to calculate environmental impact values for Fristads' High Vis Green waistcoat 5067 GPLU and High Vis waistcoat 5013 PLU to create this Environmental Product Declaration, to be used for communicating environmental performance to customers².

Scope of the study

The scope of the study is cradle to gate and includes all processes up until the jacket is manufactured and transported to Fristads' warehouse, see Figure 1. Retail, use and end-of-life processes are not included in this EPD. All material and resource consumption is tracked back to the point of raw material extraction, mainly by using cradle-to-gate data³ from the Ecoinvent database⁴. The functional unit of the study is 1 (one) garment, in accordance with the Product Category Rules (PCR)⁵. The declared unit for waistcoats is one garment in size M.

Data collection

The inventory for the LCA study was carried out during 2021. The data for the textile processing was provided by the Fristads' suppliers. Data for confectioning was collected by Fristads' staff^{6, 7, 8, 9, 10, 11}.

Allocation

Whenever it has been necessary to partition the system inputs and outputs, mass criteria have been used in accordance with the PCR. Such situations have for example been when the share of energy and water consumption, or the wastewater treatment of an entire production plant has been allocated to the specific fabric based on the total production volume of the plant.

Cut-off rules

The PCR states that life cycle inventory data for a minimum of 99 % of total inflows to the three life cycle stages (up-stream, core and downstream modules) shall be included and a cut-off rule of 1% regarding energy, mass and environmental relevance shall apply.

Assumptions and limitations

Some general assumptions have been made around transport vehicles to enable use of database data from Ecoinvent to represent primary data. Transport distances are assumed based on Google Maps distances between locations given by Fristads' suppliers. It is assumed that similar vehicles are used throughout Asia and throughout Europe respectively. Country electricity mix datasets have been used for electricity based on the fact that production sites are using country electricity net.

Generally, the LCA data should be used with precaution if interpreted for any other purpose than this EPD.

Data quality

The data quality has been considerably increased by the experience from making a similar study in the past¹². Generic data, selected generic data and proxy data has been used. It has been investigated and secured in the study that proxy data does not contribute more than 10% to the total impact of each environmental impact category, in accordance with the PCRs.

Additional information about the LCA study

Time representativeness:

2021

Database(s) and LCA software used:

SimaPro version 9.1.0.11¹³
ecoinvent version 3.6¹⁴

Calculation methods

Resource use values are calculated from Cumulative Energy Demand V1.11. Potential environmental impacts are calculated with the EPD (2018) v1.01 method as implemented in SimaPro: CML-IA baseline v3.05 for eutrophication, global warming, ozone depletion and abiotic resource depletion; CML-IA non baseline method for acidification; AWARE v1.02 for water scarcity and ReCiPe 2016 Midpoint (H) v1.1 for photochemical oxidation. For global warming potential, the default characterization factors are the IPCC (2013) factors as implemented in CML baseline method. However, the latter does not provide the same resolution in EPD (2018) V1.01 as is specified in the EPD template (fossil, bio-based respective land use and land transformation), wherefore instead the method Greenhouse Gas Protocol V1.02 is used.

Description of system boundaries:

Cradle-to-gate

LCA practitioner:

Jutta Hildenbrand, RISE
PO Box 104, SE-431 22 Mölndal, Sweden

Third party reviewer:

Marcus Wendin, Miljögraff AB, Övre Hövik 25 B,
SE-430 84 Göteborg, Sweden

System diagram.

The system boundaries of this EPD are decided by the Product Category Rules (PCR) and illustrated by Figure 1.

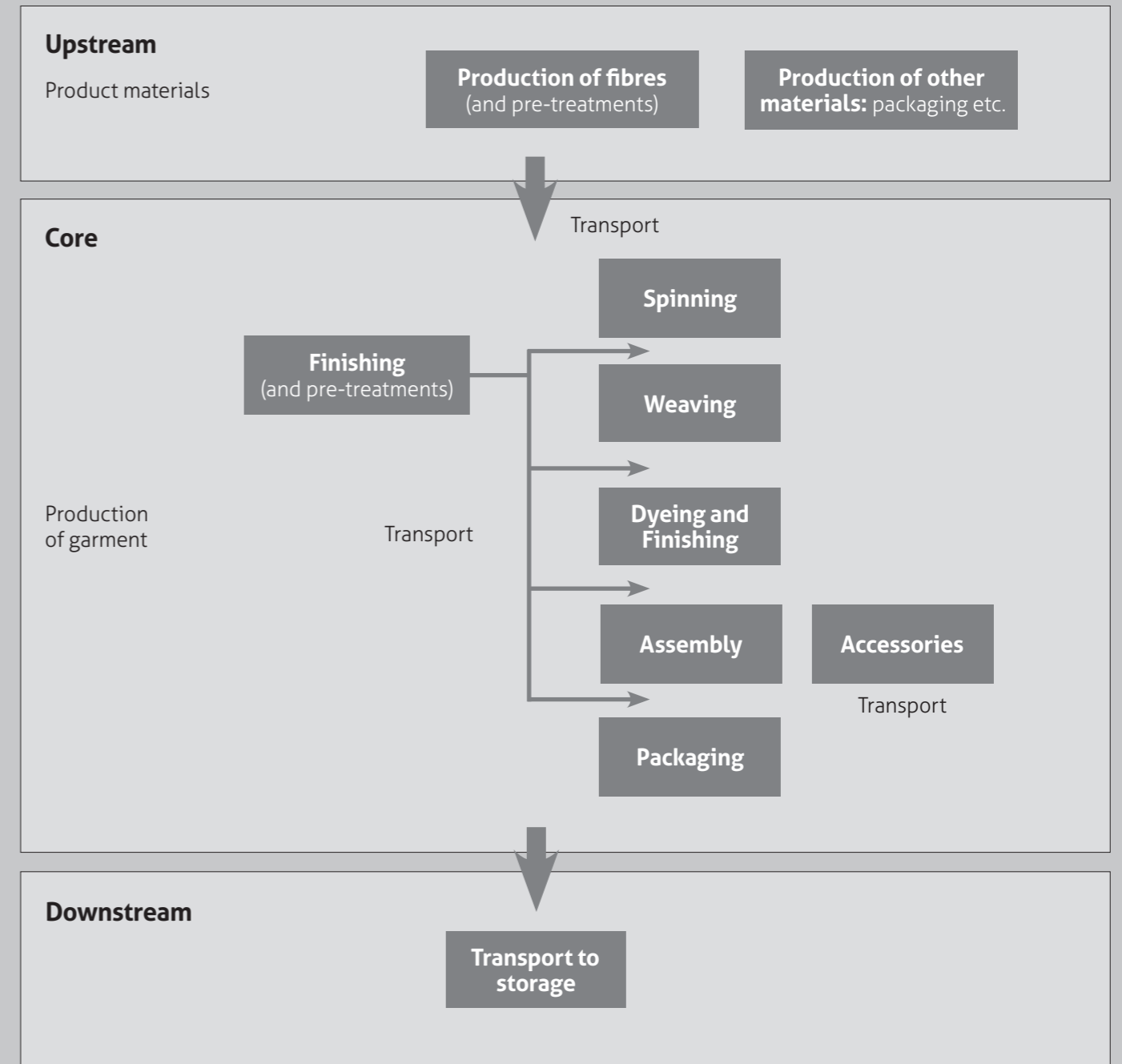


Figure 1. The system boundaries include upstream, core and downstream processes.

¹ EPD International, "General Programme Instructions for the International EPD® System Version 3.01" (Stockholm, Sweden, 2019), www.environdec.com.

² Hildenbrand, J. & Rosengren, L. (2021), Life cycle assessment of Fristads workwear – Forth batch.

³ Cradle-to-gate = all processes from cradle (mining site, forest etc.) to gate (until the goods is produced and ready for delivery at the factory gate).

⁴ Ecoinvent, "Ecoinvent" (Zurich, Switzerland: Ecoinvent, 2019), <https://www.ecoinvent.org/database/database.html>.

⁵ EPD International, "PCR 2019:04 Jackets, coats and other similar outdoor garments: UN CPC 282. Product Category Rules According to ISO 14025. Version 1.02" (2020).

⁶ Anonymous. (2021a). Facility L for confectioning.

⁷ Anonymous. (2021b). Facility U for confectioning.

⁸ Anonymous. (2021c). Facility W for weaving, dyeing and finishing.

⁹ Anonymous. (2021e). Facility S for weaving, dyeing and finishing.

¹⁰ Anonymous. (2021d). Facility C for sew-on reflective tape.

¹¹ Anonymous. (2021e). Facility I for transfer reflective tape.

¹² EPD International, "EPD GREEN CRAFTSMAN JACKET 4538 GRN. EPD Registration Number S-P-01534." (2019) <<http://www.environdec.com/en/Detail/epd710#VVxIj2cw-M8>>.

¹³ PRÉ Consultants, "SimaPro 9.1" (PRÉ Consultants, 2020), <http://www.pre-sustainability.com/simapro>.

¹⁴ Ecoinvent, "Ecoinvent" <<https://www.ecoinvent.org/database/database.html>>.

Content declaration

High Vis Green waistcoat class 2 5067 GPLU

Materials	%	Environmental / Hazardous properties
Main fabric GPLU	75,2	70% recycled polyester, 30% organic cotton
Fabric FBLA	6,1	65% polyester, 35% cotton
Interlining cotton	0,1	100% cotton
Sew-on reflective	12,8	34% polyurethane, 33% glass beads, 21,5% polyester, 11,5% cotton
Metal trims	1,3	100% brass
Care and size labels	2,1	100% polyester
Paper trims	2,1	100% paper
Thread polyester	0,3	100% polyester

Recycled material

Provenience of recycled materials (pre-consumer or post-consumer) in the product: The polyester used in GPLU garments is recycled and made from recycled post-consumer waste, certified according to Global Recycled Standard (GRS).

Organic cotton

The cotton used in GPLU garments is organic cotton, certified according to Global Organic Textile Standard (GOTS).

Packaging

Distribution packaging: Plastic bags made from 100% recycled LDPE (low density polyethylene). Cardboard box. Pallets are excluded from the calculations.

High Vis waistcoat class 2 5013 PLU

Materials	%	Environmental / Hazardous properties
Main fabric PLU	75,9	80% polyester, 20% cotton
Fabric FBLA	12,6	65% polyester, 35% cotton
Sew-on reflective	6,2	34% polyurethane, 33% glass beads, 21,5% polyester, 11,5% cotton
Metal trims	0,2	100% brass
Care and size labels	2,4	100% polyester
Paper trims	2,4	100% paper
Thread polyester	0,4	100% polyester

Packaging

Distribution packaging: Plastic bags made from 100% LDPE (low density polyethylene). Cardboard box. Pallets are excluded from the calculations.

Environmental performance

Potential environmental impact

Parameter	Unit	Waistcoat	Upstream	CORE	Down-stream	Total	
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	5067 GPLU	1,83	5,19	0,241	7,26
		5013 PLU	4,44	6,97	0,289	11,7	
	Biogenic	kg CO ₂ eq.	5067 GPLU	0,244	0,106	0,000982	0,351
		5013 PLU	0,353	0,322	0,00110	0,676	
	Land use and Land change	kg CO ₂ eq.	5067 GPLU	0,0215	0,0175	0,000123	0,0391
		5013 PLU	0,108	0,0212	0,000167	0,129	
Total	kg CO ₂ eq.	5067 GPLU	2,10	5,31	0,242	7,65	
5013 PLU	4,90	7,31	0,290	12,5			
Acidification potential (AP)	kg SO ₂ eq.	5067 GPLU	0,0122	0,0254	0,00304	0,0406	
5013 PLU	0,0306	0,034	0,00495	0,070			
Eutrophication potential (EP)	kg PO ₄ ³⁻ eq.	5067 GPLU	0,00769	0,00585	0,000395	0,0139	
5013 PLU	0,0253	0,0122	0,000602	0,0381			
Photochemical oxidant formation potential	kg NMVOC eq.	5067 GPLU	0,00718	0,0176	0,00280	0,02758	
5013 PLU	0,0167	0,0234	0,00446	0,0446			
Abiotic depletion potential – Fossil fuels	MJ, net calorific value	5067 GPLU	28,2	51,7	3,37	83,3	
5013 PLU	73,1	129	3,95	206			
Abiotic depletion potential – Elements	kg Sb eq.	5067 GPLU	0,000216	0,000035	0,00000539	0,00026	
5013 PLU	0,00037	0,0000336	0,00000592	0,00041			
Water Scarcity Footprint (WSF)	m ³ H ₂ O eq.	5067 GPLU	7,82	2,4	0,00977	10,2	
5013 PLU	26,4	3,47	0,0104	29,9			
Eutrophication – Fresh water	kg P eq.	5067 GPLU	0,00092	0,00101	0,0000175	0,002	
5013 PLU	0,00232	0,00258	0,0000193	0,005			
Eutrophication – Marine	kg N eq.	5067 GPLU	0,00721	0,00598	0,000948	0,014	
5013 PLU	0,0315	0,00763	0,00153	0,041			
Particulate matter	Disease inc.	5067 GPLU	0,000000122	0,000000376	0,000000015	0,00000051	
5013 PLU	0,000000304	0,000000357	0,000000017	0,00000068			

Use of resources

Parameter	Unit	Waistcoat	Upstream	CORE	Down-stream	Total	
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	5067 GPLU	29,2	57,5	3,62	90,3
		5013 PLU	84,7	141	4,24	230	
	Used as raw materials	MJ, net calorific value	5067 GPLU	0	0	0	0
		5013 PLU	0	0	0	0	
	Total	MJ, net calorific value	5067 GPLU	29,2	57,5	3,62	90,3
	5013 PLU	84,7	141	4,24	230		
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	5067 GPLU	4,24	5,22	0,0351	9,5
		5013 PLU	12,0	7,99	0,0393	20,0	
	Used as raw materials	MJ, net calorific value	5067 GPLU	3,45	0	0	3,45
		5013 PLU	24,3	0	0	24,3	
	Total	MJ, net calorific value	5067 GPLU	7,69	5,22	0,0351	13,0
	5013 PLU	36,3	7,99	0,0393	44,3		
Secondary material	kg	5067 GPLU	0,291	0	0	0,291	
5013 PLU	0	0	0	0			
Renewable secondary fuels	MJ, net calorific value	5067 GPLU	0	0	0	0	
5013 PLU	0	0	0	0			
Non-renewable secondary fuels	MJ, net calorific value	5067 GPLU	0	0	0	0	
5013 PLU	0	0	0	0			
Net use of fresh water	m ³	5067 GPLU	0,425	0,0380	0	0,463	
		5013 PLU	2,60	0,0520	0	2,65	

Product characteristics

Product characteristics

Characteristic	Test method	Results GPLU	Results PLU
Composition	Regulation EU No 1007/2011	70% polyester, 30% cotton	80% polyester, 20% cotton
Fabric	ISO 3572	3/1 twill	4/1 satin
Mass per unit area	EN 12127	240 g/m ²	300 g/m ²
Width	EN 1773	148 cm	150 cm
Colour index			
Abrasion strength	ISO 12947-2	70.000 rubs	45.000 rubs
Tear strength	ISO 13937-2	Warp: 35 N Weft: 30 N	Warp: 40 N Weft: 40 N
Tensile strength	ISO 13934-1	Warp: 1200 N Weft: 1000 N	Warp: 1600 N Weft: 1000 N
Seam slippage	ISO 13936-2	Warp: 2 mm Weft: 2 mm	Warp: 2 mm Weft: 2 mm
Pilling test (Martindale) after 5000 rubs	EN ISO 12945-2	4-5	4
Dimensional change to washing	EN ISO 6330 EN ISO 3759 EN ISO 5077	Warp: +/-3% Weft: +/-3%	Warp: +/-3% Weft: +/-3%
pH of water extract	EN ISO 3071	7,4	7,5
Colour fastness to artificial light: Xenon arc fading lamp test	EN ISO 105 B02	4	4
Colour fastness to washing	EN ISO 105 C06	Color change: 4-5 Color staining: Cotton 4 Polyester 4	Color change: 4 Color staining: Cotton 4 Polyester 4
Acid and alkaline perspiration	EN ISO 105 E04	Color change: 4 Color staining: Cotton 4 Polyester 4	Color change: 4 Color staining: Cotton 4 Polyester 4
Dry and wet rubbing	EN ISO 105 X12	Dry : 4 Wet : 4	Dry : 4 Wet : 3-4

Waste production and output flows

Waste production

Parameter	Unit	Waistcoat	Upstream	CORE	Downstream	Total
Hazardous waste disposed	kg	5067 GPLU	0	0	0	0
		5013 PLU	0	0	0	0
Non-hazardous waste disposed	kg	5067 GPLU	0,0640	0,0660	0	0,130
		5013 PLU	0,159	0,150	0	0,309
Radioactive waste disposed	kg	5067 GPLU	0	0	0	0
		5013 PLU	0	0	0	0

Additional information

Our garments are OEKO-TEX® certified at garment level and we have a well-established programme to monitor chemical safety compliance.

Water Scarcity Footprint in High Vis Green waistcoat 5067 GPLU and High Vis waistcoat 5013 PLU is illustrated in Figure 1.

The Global Warming Potential (GWP) of High Vis Green waistcoat 5067 GPLU and High Vis waistcoat 5013 PLU are shown in Figure 2.

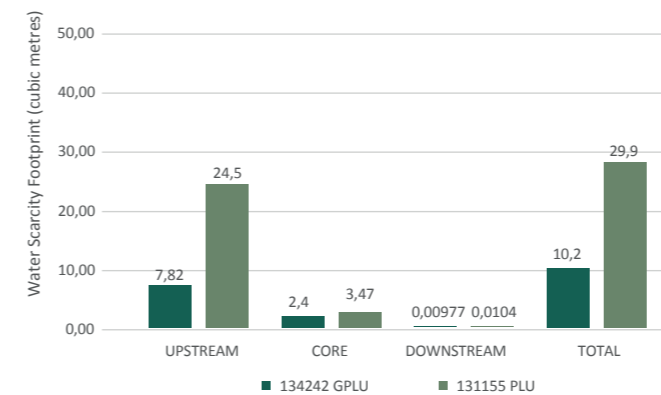


Figure 1. The Water Scarcity Footprint of High Vis Green waistcoat 5067 GPLU and High Vis waistcoat 5013 PLU. Figures for one waistcoat.

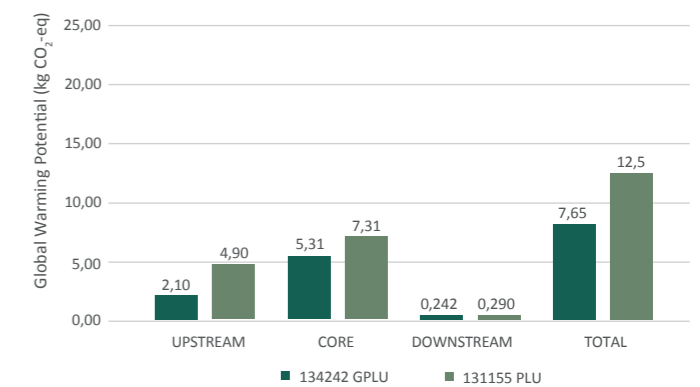


Figure 2. The Global Warming Potential of High Vis Green waistcoat 5067 GPLU and High Vis waistcoat 5013 PLU. Figures for one waistcoat.



Organic cotton requires a higher standard for cotton cultivation. It includes the health of soils, surrounding ecosystems and usage of natural processes as well as eliminating the usage of toxic fertilizers, pesticides and GMOs (Genetically Modified Organisms).

The organic cotton Fristads use is certified and can always be tracked back to the point of raw material extraction.

Organic cotton.

Recycled polyester is made from an already produced resource instead of using virgin fossil resources and it has the same qualities as synthetically made polyester fibre.

Recycled polyester can be produced in several ways, either mechanically from PET bottles or chemically from various waste materials, for example production waste from the textile industry. Fristads Green High vis collection is made of recycled polyester from PET bottles.

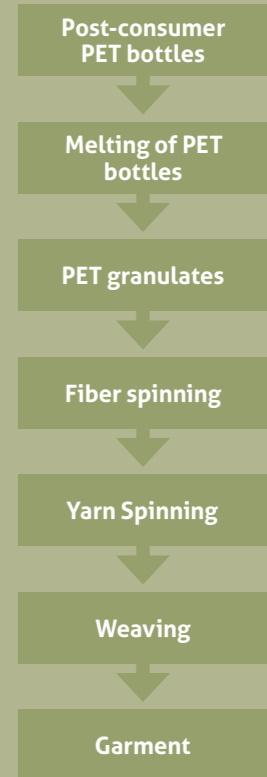
When using recycled materials it is important to secure traceability throughout the supply chain. Fristads work with transparent suppliers who can provide certificates for traceability.



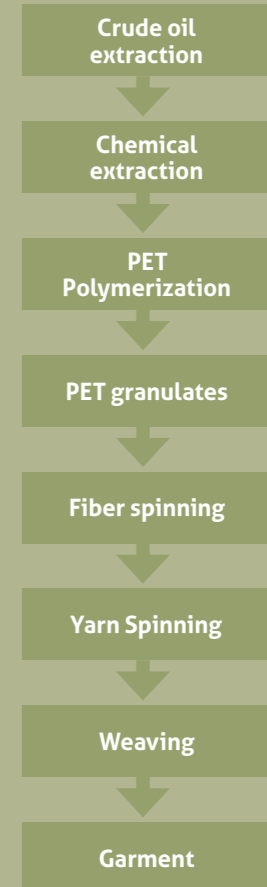
Used PET bottles turn into a great workwear.

Recycled polyester.

Mechanical recycled polyester:



Virgin polyester:



Programme-related information and verification

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com
EPD registration number:	S-P-03879
Published:	2021-09-01
Valid until:	2026-07-02
Product Category Rules:	PCR 2019:04 Jackets, coats and other similar outdoor garments. Version 1.02
Product group classification:	UN CPC 282
Reference year for data:	2021
Geographical scope:	Global

Product category rules (PCR): Jackets, coats and other similar outdoor garments. PCR 2019:04, Version 1.02, UN CPC 282.
PCR review was conducted by: The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com . The review panel may be contacted via info@environdec.com . Chair of the PCR review: Hüdai Kara, Metsims Sustainability Consulting.
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier: Marcus Wendin Miljögiraff AB Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

References

- Anonymous. (2021a). Facility L for confectioning.
- Anonymous. (2021b). Facility U for confectioning.
- Anonymous. (2021c). Facility W for weaving, dyeing and finishing.
- Anonymous. (2021e). Facility S for weaving, dyeing and finishing.
- Anonymous. (2021d). Facility C for sew-on reflective tape.
- Anonymous. (2021e). Facility I for transfer reflective tape.
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- EPD International, 'EPD GREEN CRAFTSMAN JACKET 4538 GRN. EPD Registration Number S-P-01534.' (2019)
- EPD International, 'General Programme Instructions of the International EPD® System Version 3.01' (2019) <www.environdec.com.>
- EPD International, 'PCR 2019:04 Jackets, coats and other similar outdoor garments: UN CPC 282. Product Category Rules According to ISO 14025. Version 1.02' (2020).
- Hildenbrand, J. & Rosengren, L. (2021), Life cycle assessment of Fristads workwear – Forth batch.
- PRé Consultants, 'SimaPro 9.01' <http://www.pre-sustainability.com/simapro>

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Parameter	Unit
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