

EPD<sup>®</sup>

FRISTADS<sup>®</sup>

# EPD – Environmental Product Declaration.

In accordance with ISO 14025 for:  
Craftsman stretch trousers 2900 GWM.

Main fabric GWM: 65% recycled polyester, 35% cotton.

## General information

### Owner of the EPD:

Fristads AB Prognosgatan 24, 504 64 Borås, Sweden  
Contact person: Lisa Rosengren, Head of R&D Raw Material  
lisa.rosengren@fristads.com  
www.fristads.com

### Location of production site:

Vientiane, Laos

Programme:

The international EPD<sup>®</sup> system  
www.environdec.com

Programme operator:

EPD international AB

EPD registration number:

S-P-13198

Publication date:

2024-06-28

Validity date:

2029-06-28

Geographical scope:

Global



### CRAFTSMAN STRETCH TROUSERS 2900 GWM

Art. no 301018

Partly recycled material / Mechanical stretch / Large 4-way stretch panels at back and crotch / 2 loose-hanging pockets, fully lined with more durable material – one with 2 pockets whereof one with zip, one with 3 smaller pockets and tool loops / 2 front pockets / 2 back pockets of more durable material / Extra loops for id-card or keys at front / Double reinforced crotch seam / Hammer loop / Folding rule pocket of more durable material with pen pocket and concealed button and loop for sheath knife / Large leg pocket of more durable material with zip pocket, also useful for folding rule / CORDURA®-reinforced knee pockets with outside opening from above / Height adjustment for knee pads in knee pocket / Reinforced leg end with more durable material / Adjustable leg length with 5 cm hem allowance / Reflective details at back of knees / Approved according to EN 14404 together with kneepads 124292 / OEKO-TEX® certified.

**MATERIAL** Main fabric 65% recycled polyester, 35% cotton, mechanical stretch twill. Stretch 92% recycled polyester, 8% elastane. Other fabric 100% recycled polyester.

**WEIGHT** Main fabric 250 g/m<sup>2</sup>. Stretch 220 g/m<sup>2</sup>. Other fabric 230 g/m<sup>2</sup>.

**COLOUR** 544 Dark navy, 940 Black.

**SIZE** C44-C64, D84-D120.

# 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® System<sup>1</sup>. The goal of the present LCA study has been to calculate environmental impact values for Fristads' Craftsman stretch trousers 2900 GWM, to create this Environmental Product Declaration, to be used for communicating environmental performance to customers<sup>2</sup>.

## Scope of the study

The scope of the study is cradle to gate and includes all processes up and until finished garment is transported to customer, 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 data<sup>3</sup> from the Ecoinvent database<sup>4</sup>. The declared unit of the study is 1 (one) garment in size C52, in accordance with the Product Category Rules (PCR)<sup>5</sup>.

## Data collection

The inventory for the LCA study was carried out during 2023-2024. The data for the textile processing was provided by the Fristads' suppliers. Data for the production was collected by Fristads' staff<sup>6,7,8,9,10</sup>. The collected data cover all steps of the system boundary.

## 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. For assembly, electricity consumption has been allocated by production time.

## 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 down-stream 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.

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 past<sup>11,12</sup>. 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:

2023

### Database(s) and LCA software used:

SimaPro version 9.5.0.1<sup>13</sup>  
ecoinvent version 3.9.1<sup>4</sup>

### Calculation methods

The potential environmental impact for all impact categories have been calculated with the EN 15804+A2 method as implemented in SimaPro, based on EF 3.1. Use of resources are calculated with the method Cumulative Energy Demand v1.11.

### Description of system boundaries:

Cradle-to-gate

### LCA practitioner:

The LCA has been conducted by the Raw Material team at Fristads.

### Third party reviewer:

Marcus Wendin, Miljögiraff AB,  
Övre Hövik 25 B, SE-430 84 Göteborg, Sweden  
(marcus@miljogiraff.se)

# System diagram.

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

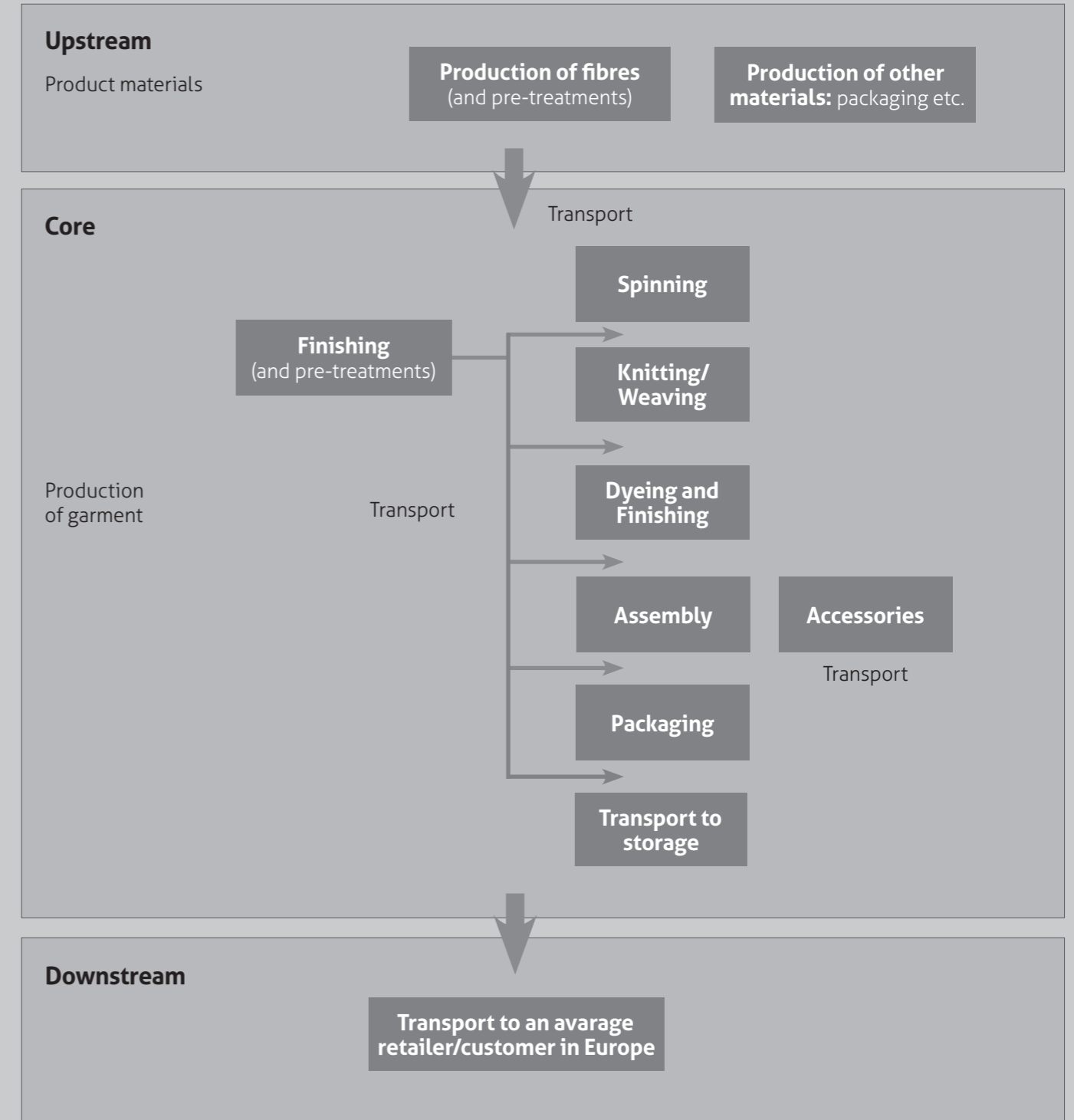


Figure 1. The system boundaries include upstream, core and downstream processes.

<sup>1</sup> EPD International. (2021a). *General Programme Instructions for the International EPD® System version 4.0.*

<sup>2</sup> Rosengren, L. and Lindström, F. (2024). *Life cycle assessment report Fristads workwear – GWM collections Alnaryd & Forsbo.*

<sup>3</sup> 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).

<sup>4</sup> Ecoinvent (2023). Ecoinvent (3.9.1) Ecoinvent. <https://ecoinvent.org/the-ecoinvent-database/>

<sup>5</sup> EPD International. (2024). *PCR 2019:06 Trousers, shorts and slacks and similar garments: UN CPC 282. Product Category Rules according to ISO 14025. Version 1.0.5.* Stockholm, Sweden.

<sup>6</sup> Anonymous. (2023a). *Facility M for spinning, weaving, dyeing, and finishing.*

<sup>7</sup> Anonymous. (2023b). *Facility D for spinning, weaving, dyeing, and finishing.*

<sup>8</sup> Anonymous. (2023c). *Facility HY for spinning, weaving, dyeing, and finishing.*

<sup>9</sup> Anonymous. (2024a). *Facility HU for spinning, weaving, dyeing, and finishing.*

<sup>10</sup> Anonymous. (2024b). *Facility O for cut and sew.*

<sup>11</sup> Rosengren, L. and Lindström, F. (2023). *Life cycle assessment report Fristads workwear – Craftsman stretch GCYD collection.*

<sup>12</sup> Rosengren, L. and Steenari, M. (2023). *Life cycle assessment report Fristads workwear – GS25 collection.*

<sup>13</sup> PRé Consultants. (2023). SimaPro 9.5.0.1. Retrieved from <http://www.pre-sustainability.com/simapro>.

## Content declaration

### Craftsman stretch trousers 2900 GWM.

| Content Declaration           | %    | Environmental/Hazardous properties                                     |
|-------------------------------|------|--|
| Main fabric GWM               | 37,3 | 65% recycled polyester (post-consumer), 35% cotton                     |
| Reinforcement fabric          | 22,8 | 100% recycled polyester (post-consumer)                                |
| Stretch panels                | 13,9 | 92% recycled polyester (post-consumer), 8% elastane                    |
| Detail fabric FBLA            | 12,5 | 65% polyester, 35% cotton  |
| Reinforcement fabric ADKN     | 4,3  | 100% polyamide   |
| Sewing thread                 | 3,1  | 100% polyester   |
| Metal trims                   | 1,5  | 100% brass   |
| Paper trims                   | 1,1  | 100% paper   |
| Zipppers coated               | 0,9  | 50% polyester, 50% polyurethane  |
| Velcro                        | 0,7  | 100% polyamide   |
| Elastic reflex                | 0,6  | 50% glass beads, 27% polyester, 20% polyurethane adhesive, 3% elastane |
| LSH trim                      | 0,4  | 100% polyester   |
| Rubber label                  | 0,3  | 100% synthetic rubber  |
| Zipppers                      | 0,3  | 100% recycled polyester (post-consumer)                                |
| Care and size labels          | 0,2  | 100% polyester   |
| Interlining                   | 0,08 | 100% cotton  |
| Care and size labels recycled | 0,05 | 100% recycled polyester (post-consumer)                                |
| Sewing thread recycled        | 0,02 | 100% recycled polyester (post-consumer)                                |

### Packaging

Distribution packaging: Cardboard box. Pallets are excluded from the calculations.

## Environmental performance

### Craftsman stretch trousers 2900 GWM. Declared unit size C52.

#### Potential environmental impact

| Parameter  | Unit                     | Upstream               | CORE        | Downstream    | Total       |       |
|--|--------------------------|------------------------|-------------|---------------|-------------|-------|
| Global warming potential (GWP)   | Fossil                   | kg CO <sub>2</sub> eq. | 2,81        | 9,99          | 0,122       | 12,9  |
|  | Biogenic                 | kg CO <sub>2</sub> eq. | -0,385      | 0,142         | 0,584       | 0,341 |
|  | Land use and land change | kg CO <sub>2</sub> eq. | 0,0992      | 0,00388       | 0,0000592   | 0,103 |
|  | <b>Total</b>             | kg CO <sub>2</sub> eq. | 2,52        | 10,1          | 0,706       | 13,4  |
| Acidification potential (AP)   | mol H+ eq.               | 0,0308                 | 0,0444      | 0,000398      | 0,0756      |       |
| Eutrophication potential (EP) - Fresh water                                  | kg P eq.                 | 0,00167                | 0,00149     | 0,00000840    | 0,00317     |       |
| Eutrophication potential (EP) - Marine                                       | kg N eq.                 | 0,0279                 | 0,00983     | 0,000137      | 0,0379      |       |
| Eutrophication potential (EP) - Terrestrial                                  | mol N eq.                | 0,0902                 | 0,103       | 0,00145       | 0,195       |       |
| Photochemical oxidant formation potential                                    | kg NMVOC eq.             | 0,0124                 | 0,0339      | 0,000594      | 0,0469      |       |
| Abiotic depletion potential (ADP) for fossil resources                       | MJ                       | 41,1                   | 119         | 1,73          | 162         |       |
| Abiotic depletion potential (ADP) for minerals/metals (non-fossil resources) | kg Sb eq.                | 0,0000942              | 0,00000555  | 0,000000392   | 0,000100    |       |
| Water deprivation potential (WDP)  | m <sup>3</sup> depriv.   | 23,5                   | 1,12        | 0,00705       | 24,6        |       |
| Ozone depletion potential (ODP)  | kg CFC 11 eq.            | 0,00000180             | 0,000000100 | 0,00000000265 | 0,00000190  |       |
| Particulate matter   | Disease inc.             | 0,000000299            | 0,000000518 | 0,00000000971 | 0,000000827 |       |

#### Use of resources

| Parameter                                | Unit                    | Upstream                | CORE   | Downstream | Total  |      |
|--|-------------------------|-------------------------|--------|------------|--------|------|
| Primary energy resources – Renewable     | Use as energy carrier   | MJ, net calorific value | 44,1   | 129        | 1,84   | 175  |
|  | Used as raw materials   | MJ, net calorific value | 2,63   | 0          | 0      | 2,63 |
|  | <b>Total</b>            | MJ, net calorific value | 46,7   | 129        | 1,84   | 177  |
| Primary energy resources – Non-renewable | Use as energy carrier   | MJ, net calorific value | 9,30   | 3,90       | 0,0268 | 13,2 |
|  | Used as raw materials   | MJ, net calorific value | 8,88   | 0          | 0      | 8,88 |
|  | <b>Total</b>            | MJ, net calorific value | 18,2   | 3,90       | 0,0268 | 22,1 |
| Secondary material                       | kg                      | 0,537                   | 0      | 0          | 0,537  |      |
| Renewable secondary fuels                | MJ, net calorific value | 0                       | 0      | 0          | 0      |      |
| Non-renewable secondary fuels            | MJ, net calorific value | 0                       | 0      | 0          | 0      |      |
| Net use of fresh water                   | m <sup>3</sup>          | 2,36                    | 0,0727 | 0          | 2,43   |      |

## Product characteristics

### Product characteristics

| Characteristic   | Test method                | Results GWM  |
|--|----------------------------|--|
| Composition  | Regulation EU No 1007/2011 | 65% polyester<br>35% cotton  |
| Weave  | ISO 3572                   | Twill 2/1  |
| Mass per unit area   | EN 12127                   | 250 g/m <sup>2</sup>   |
| Width  | EN 1773                    | 150 cm   |
| Colour index   |                            |  |
| Abrasion strength  | ISO 12947-2                | 45000 rubs   |
| Tear strength  | ISO 13937-2                | Warp: 30 N<br>Weft: 30 N   |
| Tensile strength   | ISO 13934-1                | Warp: 1600 N<br>Weft: 700 N  |
| Seam slippage  | ISO 13936-2                | Warp: 3 mm<br>Weft: 3 mm   |
| Pilling test (Martindale) after 5000 rubs                          | EN ISO 12945-2             | 4  |
| Dimensional change to washing                                      | EN ISO 6330<br>EN ISO 5077 | Warp: ±3%<br>Weft: ±3%   |
| pH of water extract  | EN ISO 3071                | 4-7,5  |
| Colour fastness to artificial light:<br>Xenon arc fading lamp test | EN ISO 105 B02             | 4  |
| Colour fastness to washing   | EN ISO 105 C06             | Color change: 4<br><br>Color staining:<br>Cotton 3-4<br>Polyester 3-4<br>Viscose 3-4   |
| Acid and alkaline perspiration                                     | EN ISO 105 E04             | Alkaline and acid<br>Color change: 4<br><br>Color staining:<br>Cotton 4<br>Polyester 4 |
| Dry and wet rubbing  | EN ISO 105 X12             | Dry : 4<br>Wet : 2-3   |

## Waste production and output flows

### Waste production

| Parameter                    | Unit | Upstream | CORE  | Downstream | Total |
|------------------------------|------|----------|-------|------------|-------|
| Hazardous waste disposed     | kg   | 0        | 0     | 0          | 0     |
| Non-hazardous waste disposed | kg   | 0,00123  | 0,157 | 0          | 0,158 |
| Radioactive waste disposed   | kg   | 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.

The results in this EPD is for the declared unit size C52, which is in the middle of Fristads' size range. Results may vary depending on the garment size within the size range.

## 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<br><br>EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden<br><br>www.environdec.com<br>info@environdec.com |
| EPD registration number:      | S-P-13198   |
| Published:                    | 2024-06-28  |
| Valid until:                  | 2029-06-28  |
| Product Category Rules:       | PCR 2019:06 Trousers, shorts, slacks and similar garments. Version 1.0.5  |
| Product group classification: | UN CPC 282  |
| Reference year for data:      | 2023  |
| Geographical scope:           | Global  |

|   |
|---|
| Product category rules (PCR):<br>PCR 2019:06 Trousers, shorts and slacks and similar garments, Version 1.0.5, UN CPC 282.   |
| PCR review was conducted by:<br>The Technical Committee of the International EPD® System. A full list of members available on <a href="http://www.environdec.com">www.environdec.com</a> . The review panel may be contacted via <a href="mailto:info@environdec.com">info@environdec.com</a> .<br>Chair of the PCR review:<br>Hüdai Kara, Metsims Sustainability Consulting. |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006:<br><input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification   |
| Third party verifier:<br><br>Marcus Wendin, Miljögiraff AB,<br>( <a href="mailto:marcus@miljogiraff.se">marcus@miljogiraff.se</a> )<br><br>Approved by: The International EPD® System   |
| Procedure for follow-up of data during EPD validity involves third party verifier:<br><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |

## Appendix

The products in the appendix have been modelled like the declared product and the difference in environmental impact between declared product and appendix products have been calculated. The difference between declared product and appendix products is less than 10% in all environmental impact categories. The declared product and the appendix product contain the same ingoing components and are produced using the same processes. The declared product is considered most representative and suitable as declared product because it has the higher impact of the included products.

| Garment name                                    | Art no | Description |
|---|--------|-------------|
| Green craftsman stretch trousers woman 2901 GWM | 301223 |             |



## References

Anonymous. (2023a). *Facility M for spinning, weaving, dyeing, and finishing*.  
 Anonymous. (2023b). *Facility D for spinning, weaving, dyeing, and finishing*.  
 Anonymous. (2023c). *Facility HY for spinning, weaving, dyeing, and finishing*.  
 Anonymous. (2024a). *Facility HU for spinning, weaving, dyeing, and finishing*.  
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 Rosengren, L., Lindström, F. (2023). *Life cycle assessment of Fristads workwear – Craftsman stretch GCYD collection*.  
 Rosengren, L. and Lindström, F. (2024). *Life cycle assessment report Fristads workwear – GWM collections Alnaryd & Forsbo*.  
 Rosengren, L. and Steenari, M. (2023). *Life cycle assessment report Fristads workwear – GS25 collection*.

## Contact information

| Parameter           | Unit   |
|---------------------|--|
| EPD owner:          | <b>Fristads AB</b><br>Prognosgatan 24 , 504 64 Borås<br>Sweden<br><br><b>Contact person:</b><br>Lisa Rosengren<br><a href="mailto:lisa.rosengren@fristads.com">lisa.rosengren@fristads.com</a><br><a href="http://www.fristads.com">www.fristads.com</a> |
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| Programme operator: | EPD International AB<br><a href="mailto:info@environdec.com">info@environdec.com</a>   |