Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Game fence

from

Häggroth Stängsel

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): Product category rules (PCR): Construction products Version 1.3.4
PCR review was conducted by: The Technical Committee of the International EPD® System. Chair: Martin Erlandsson, IVL Swedish Environmental Research Institute, Contact: martin.erlandsson@ivl.se
Life Cycle Assessment (LCA)
LCA accountability: LIFE CYCLE ASSESSMENT OF GAME FENCE, AFRY
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Viktor Hakkarainen *CHM Analytics* Approved by: The International EPD® System

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: Häggroths stängsel
Contact: Kjell Häggroth, kjell@haggrothstangsel.se
Description of the organisation: Häggroth Stängsel is a company supplying various fencing products to customers in the public and private sectors.
Product-related or management system-related certifications:
Name and location of production site(s): Luleå and Viserum

Product information

Product name: Game fence including gate wing posts, mesh and rooting net
Product identification:
The final product is a galvanized game fence that incudes components presented in table.

Name of part	Part number
Mesh	VSX21121510
Rooting net	N136025FZ2
Wing post	VST
Gate	VG2010FZ

Product description:
The game fence ensures road safety by preventing wildlife collisions. In this case, fencing of the highest quality and safety is required. Over time, it has been shown that wildlife fences with continuous vertical wires are the best solution to meet these requirements. The unique S-lock knot maintains vertical integrity, preventing animals from breaching the fence. The fence has a surface treatment with a high zinc coating, making the mesh resistant to rust and corrosion. In some areas of Sweden, a rooting net is installed at the lower parts of the fence to ensure that wild boars do not get through the mesh.
Steel poles are installed at 4 meters intervals as to keep the fence upright. A gate is installed on average at 5 km intervals. Table 1 presents the content per meter of final product.

UN CPC code:

Geographical scope: China, Portugal and Sweden (modules A1-A5). Sweden, end-of-life (module C-D)

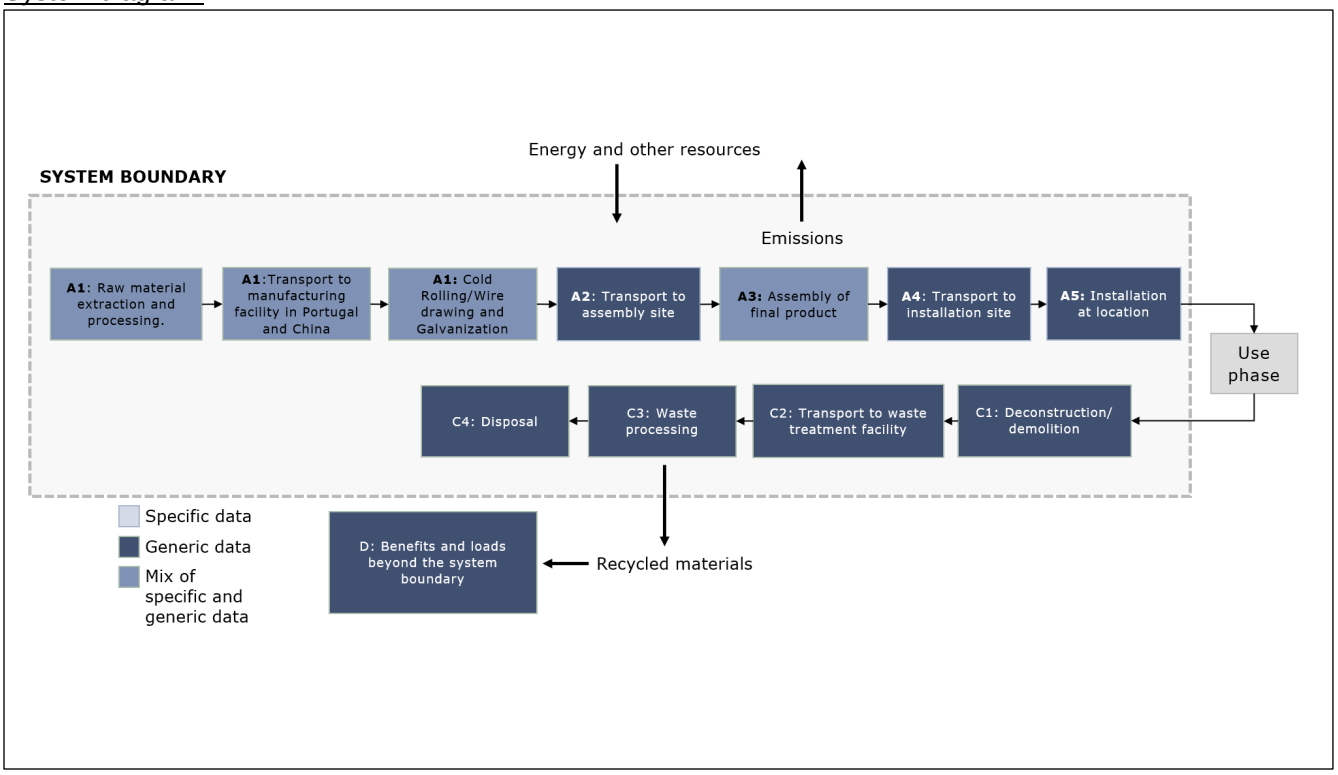
LCA information

Functional unit / declared unit: The declared unit to which the results are normalized, in order to express the results on the same basis, has been set to 1 m of installed game fence. The weight per meter is 5.5kg.

Infrastructure is not modelled directly but are included in the background datasets.

Reference service life: not applicable.
Time representativeness: 2024
Database(s) and LCA software used: SimaPro software (v.9.6.0.1). Ecoinvent data base (3.10)
Description of system boundaries:
Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A5 + C + D and additional modules).

System diagram:



More information:

A1: Raw Material

This stage includes raw material extraction and production of bought components.

A2: Transport

This stage includes the transportation of components to final site of assembly.

A3: Manufacturing

This stage includes resource use in the manufacturing facility in Luleå and Virserum such as the use of energy.

A4: Transport to installation site

A5: Installation

C1: Deconstruction

This stage includes impacts from energy use related to the deconstruction of the game fence.

C2: Waste Transport

Includes the transportation of the discarded product to a waste treatment facility. 100 km transportation is assumed.

C3: Waste Processing

This stage includes sorting of waste

C4: Waste disposal

Recycling of steel components

D: Benefits and loads outside the system boundary

This stage includes benefits and burdens associated with recycling that affect future life cycles. For this product, it includes benefits from the recycling of the metals.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO/ EUR	GLO/ EUR	SE	SE	SE								SE	SE	SE	SE	EUR
Specific data used	<1 % of the total GWP_GHG impact stems from specific data					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%					-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Galvanized low carbon steel	5.5	0	0
TOTAL	5.5	0	0
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
TOTAL	0	0	0

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
No SVHC substances in product			

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804 (E.F 3.1 characterization factors)

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO_2 eq.	2.6E+01	2.0E-01	6.6E-01	ND	ND	ND	ND	ND	ND	ND	1.2E-01	1.0E-01	4.6E-03	3.4E-03	-8.0E+00
GWP-biogenic	kg CO_2 eq.	5.1E-01	1.4E-04	2.0E-04	ND	ND	ND	ND	ND	ND	ND	2.6E-05	7.2E-05	1.4E-04	4.7E-07	2.8E-02
GWP-luluc	kg CO_2 eq.	5.4E-02	6.7E-05	6.9E-05	ND	ND	ND	ND	ND	ND	ND	1.2E-05	3.5E-05	1.2E-05	1.8E-06	1.5E-04
GWP-total	kg CO_2 eq.	2.7E+01	2.0E-01	6.6E-01	ND	ND	ND	ND	ND	ND	ND	1.2E-01	1.0E-01	4.7E-03	3.4E-03	-7.9E+00
ODP	kg CFC 11 eq.	2.8E-07	4.0E-09	1.2E-08	ND	ND	ND	ND	ND	ND	ND	2.1E-09	2.1E-09	8.2E-11	9.9E-11	-2.2E-08
AP	mol H^+ eq.	1.5E-01	4.2E-04	5.4E-03	ND	ND	ND	ND	ND	ND	ND	8.4E-04	2.2E-04	2.8E-05	2.4E-05	-3.0E-02
EP-freshwater	kg P eq.	1.3E-02	1.4E-05	2.8E-05	ND	ND	ND	ND	ND	ND	ND	4.4E-06	7.1E-06	3.8E-06	2.9E-07	-3.4E-03
EP-marine	kg N eq.	3.4E-02	1.0E-04	2.5E-03	ND	ND	ND	ND	ND	ND	ND	3.9E-04	5.2E-05	5.6E-06	9.3E-06	-6.8E-03
EP-terrestrial	mol N eq.	3.6E-01	1.1E-03	2.7E-02	ND	ND	ND	ND	ND	ND	ND	4.2E-03	5.6E-04	5.5E-05	1.0E-04	-7.4E-02
POCP	kg NMVOC eq.	1.1E-01	7.0E-04	8.4E-03	ND	ND	ND	ND	ND	ND	ND	1.3E-03	3.6E-04	1.8E-05	3.6E-05	-2.5E-02
ADP-minerals&metals*	kg Sb eq.	2.3E-03	6.6E-07	2.9E-07	ND	ND	ND	ND	ND	ND	ND	4.9E-08	3.4E-07	5.7E-08	5.4E-09	-7.2E-05
ADP-fossil*	MJ	1.7E+02	2.4E-01	5.1E-01	ND	ND	ND	ND	ND	ND	ND	8.1E-02	1.2E-01	6.8E-02	5.2E-03	-5.9E+01
WDP*	m^3	1.2E+01	1.2E-02	2.2E-02	ND	ND	ND	ND	ND	ND	ND	3.8E-03	6.1E-03	1.2E-03	3.7E-03	-5.3E-01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator. The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes. Discourages the use of results in A1-A3 without taking module C into account.*

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	2.6E+01	2.0E-01	6.6E-01	ND	ND	ND	ND	ND	ND	ND	1.2E-01	1.0E-01	4.6E-03	3.4E-03	-8.0E+00

Resource use indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	3.3E+01	4.9E-02	8.3E-02	ND	ND	ND	ND	ND	ND	ND	1.3E-02	2.5E-02	2.5E-02	7.8E-04	-4.2E+00
PERM	MJ	0.0E+00	0.0E+00	0.0E+00	ND	ND	ND	ND	ND	ND	ND	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PERT	MJ	3.3E+01	4.9E-02	8.3E-02	ND	ND	ND	ND	ND	ND	ND	1.3E-02	2.5E-02	2.5E-02	7.8E-04	-4.2E+00
PENRE	MJ	1.8E+02	2.5E-01	5.3E-01	ND	ND	ND	ND	ND	ND	ND	8.4E-02	1.3E-01	7.0E-02	5.5E-03	-6.2E+01
PENRM	MJ	0.0E+00	0.0E+00	0.0E+00	ND	ND	ND	ND	ND	ND	ND	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PENRT	MJ	1.8E+02	2.5E-01	5.3E-01	ND	ND	ND	ND	ND	ND	ND	8.4E-02	1.3E-01	7.0E-02	5.5E-03	-6.2E+01
SM	kg	0.0E+00	0.0E+00	0.0E+00	ND	ND	ND	ND	ND	ND	ND	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RSF	MJ	0.0E+00	0.0E+00	0.0E+00	ND	ND	ND	ND	ND	ND	ND	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRSF	MJ	0.0E+00	0.0E+00	0.0E+00	ND	ND	ND	ND	ND	ND	ND	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
FW	m^3	7.0E-01	4.2E-04	7.0E-04	ND	ND	ND	ND	ND	ND	ND	1.2E-04	2.2E-04	2.9E-05	8.7E-05	-2.5E-02
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Waste indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	0.00 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Non-hazardous waste disposed	kg	0.00 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Radioactive waste disposed	kg	0.00 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00

Output flow indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0.00 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Material for recycling	kg	0.00 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0.00 E+00	0.00 E+00	5.00 E+00	0.00 E+00	0.00 E+00
Materials for energy recovery	kg	0.00 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Exported energy, electricity	MJ	0.00 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Exported energy, thermal	MJ	0.00 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00

References

General Programme Instructions of the International EPD® System. Version 4.0.
PCR 2019:14. Construction products Version 1.3.4
Termèn, L. (2025): Life cycle assessment of game fence

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