Environmental Product Declaration

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

Steel structural hollow section (hot-formed), painted and non-painted

from

Stalia AB

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-09490
Publication date:	2023-10-10
Valid until:	2028-10-10
Multiple product grouping:	EPD of multiple products, based on worst-case results. The products included are steel structural hollow sections (hot-formed), both painted and non-painted, from three different suppliers

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
E-mail:	info@environdec.com

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): Construction products, PCR 2019:14, Version 1.3.1 UN CPC code: 41288 Tubes and pipes, of non-circular cross section, welded, of steel
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact
Life Cycle Assessment (LCA)
LCA accountability: Alexander Munge, Viktor Hakkarainen, VästLCA AB
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: David Althoff Palm, Dalemarken AB Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

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 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.

The use of the EPD is restricted to steel supplied by suppliers E, F and G mentioned in the background report. Contact Stalia directly for information if this EPD is valid for a specific purchase.

Company information

Owner of the EPD:
Stalia AB

Contact: Dannie Obad (dannie.obad@stalia.se)

Description of the organisation:
Stalia AB is a Swedish wholesaler that stores, sells, and further refines a wide portfolio consisting of various steel and metal products.

Product-related or management system-related certifications:

- EN 1090-1:2009+A1:2011

Name and location of production site(s):
Stalia AB, Industrivägen 10, 313 94 Sennan, SE

Product information

Product name: Steel structural hollow sections (hot-formed)

Product description:
Supplier E produces steel structural hollow sections based on hot-rolled coils. Supplier F produce steel structural hollow sections in a variety of dimensions, properties and chemical composition (based on 36% post-consumer scrap). Supplier G is a wholesaler from which Stalia AB purchases steel structural hollow sections (both hot-formed and cold-finished). All suppliers deliver structural hollow sections with a steel grade of S355.

The structural hollow sections are used for structural and general construction purposes and vary in physical dimensions, chemical composition, and technical specifications depending on customer need.

UN CPC code:
41287 Other rubes and pipes, of circular cross-section, welded, of steel
41288 Tubes and pipes, of non-circular cross-section, welded, of steel

Geographical scope: China, France, and Sweden. Products under study are purchased from supplier in China, France, and wholesaler in Sweden, but all are used in Sweden.

LCA information

Functional unit / declared unit: 1 000 kg of Steel structural hollow sections (hot-formed)

Reference service life: Not applicable

Time representativeness: January 1st – December 31st 2022.

Database(s) and LCA software used:
The LCA software used for modelling was SimaPro version 9.5.0.1, with Ecoinvent 3.9.1 as a complementary database in addition to direct inputs from the steel supplier EPDs.

Description of system boundaries:
b) Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and additional modules). The additional module included in the system boundary is A4.

A1-A3 Cradle-to-gate

Production of all steel products from the suppliers that is purchased by Stalia are based on existing EN15804+A2 EPDs developed by each supplier or LCI data derived from type EN15804+A1 EPDs. The EN15804+A2 EPDs include production and handling of raw materials, energy use, auxiliary materials, transportation to production site, disposal and handling of production scrap.

The electricity mix used at Stalia is modelled as Swedish residual electricity with a GWP-GHG of 0,079 kg CO2,eq/kWh.

When Stalia AB receives the steel beams from the supplier, paint is sometimes applied to the product before transporting to customer, a process which is also included.

A4 Transportation

Transportation of purchased product between supplier and Stalia AB, as well as between Stalia AB and a typical customer in Sweden.

Material	Country of origin	Distance (km)	Type of transport
Steel beams from Supplier E	China	20 422 (+17)	Boat (+ truck)
Steel beams from Supplier F	France	1 196	Truck
Steel beams from Supplier G	Italy	1 679	Truck
Transportation from Stalia to customer	Sweden	150	Truck

Supplier E has a transport from Shanghai to Halmstad via boat, with the additional 17km covering the road transportation from harbour to Stalia AB warehouse.

Supplier F has several production facilities around Europe, the furthest distance was taken to maintain conservative modelling.

Supplier G sells products to Stalia AB from a supplier in Italy and one in the Netherlands. Distance taken from Cremona, Italy which was the furthest distance from Supplier G, and since the product distribution is not known, the conservative approach was taken.

C1 Demolition/Deconstruction

Presented scenarios in for modules C1-D are currently in use and are representative for one of the most probable alternatives.

This Chapter describes the energy needed to demolish the steel.

Activity	Energy type	Amount (MJ/DU)
Demolition	Diesel	11 MJ

Energy requirements for removal of steel is based on (Erlandsson & Pettersson, 2015). As a conservative measure, it is assumed that the demolition takes place more than 6m above ground level.

C2 Transport to waste processing

Transport	Distance
Road	50 km

C3 Waste processing for reuse, recovery and/or recycling

The materials are assumed to go through a crushing and sorting process according to values in the table below.

Material	Treatment type	Amount (kg/DU)
Steel	Material recycling	850

C4 Final disposal

Material	Treatment type	Amount (kg/DU)
Steel	Inert waste	150

D Benefits and loads beyond the product system

The D module is calculated with a formula originally proposed in EN 15804 and adjusted with a factor for material yield (Y) in PCR:2019:14.

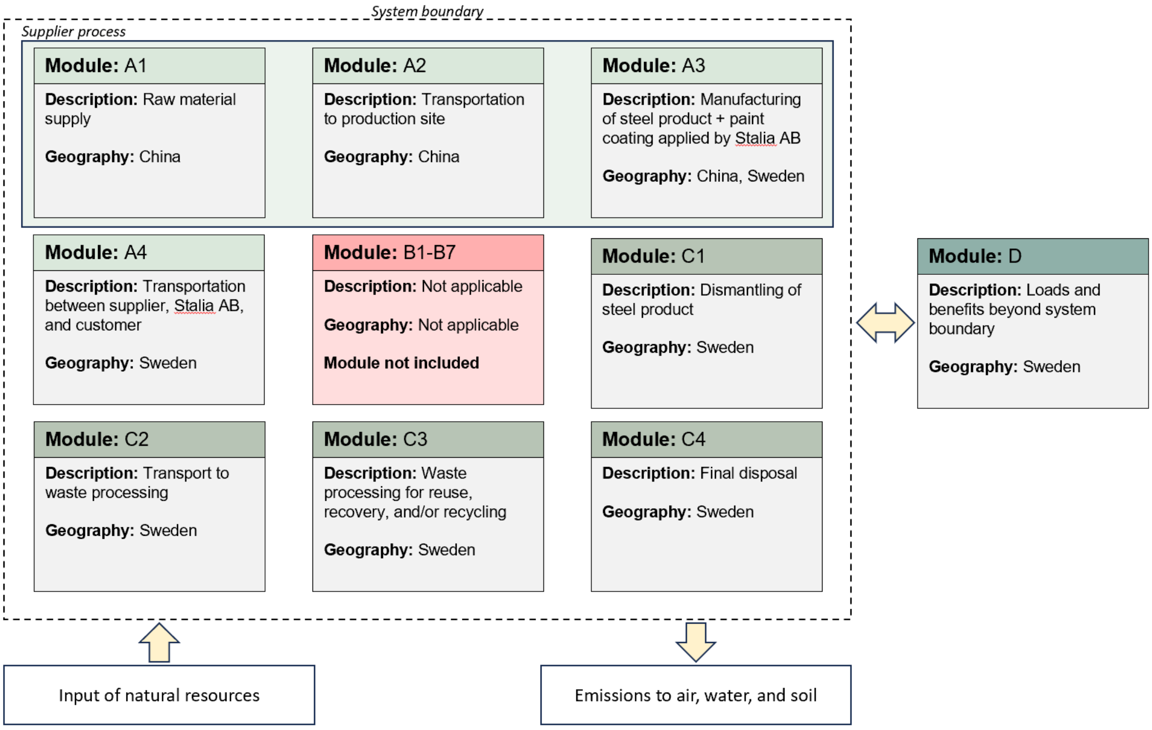
Formula for calculating net benefits and loads for export of secondary materials (recycling of materials):

$$e_1 = \Sigma(Y \bullet M_{MR,out} - Y \bullet M_{MR,in}) \bullet (E_{MR\ after\ EoW\ out} - E_{VM\ Sub\ out} \bullet \frac{Q_{R,out}}{Q_{Sub}}) \quad \text{(Eq.1)}$$

No benefits or loads from export of energy.

<u>System diagram:</u>
The system boundary of the EPD is cradle-to-gate with options, meaning that modules A1-A4, C, and D are declared, exempting module A5 + B from the model. Modules A1-A3, illustrated in figure 1, are all part of the supplier process in which Stalia AB does not perform any activities due to their position as a wholesaler. Module A3 also includes a process conducted by Stalia AB at their facility in Sweden, which takes place, process-wise, after transport in module A4, consisting of the occasional application of a paint coating on the purchased steel products from the supplier.

The system boundary to nature is set to include those processes that provide the material and energy inputs into the system and the following manufacturing, and transport processes up to the factory gate as well as the processing of any waste arising from the processes.



All infrastructure/capital goods are included as a standard through the datasets used in ecoinvent for all generic data. Data used from the EPDs (from suppliers of Stalia AB) must cover infrastructure/capital goods in modules A1-A3 if it is deemed relevant, and should therefore be included by extension in this LCA.

Assumptions:

- The Greenhouse gas reduction mandate for transport that is implemented in Sweden is not applied since there are international routes covered in the model
- The steel products are assumed to have a coating of paint applied to them as there was no data available regarding what product was painted, in order to maintain a conservative approach
- When recycled steel is declared to be used as input by the suppliers but it's not specified if it's pre or post-consumer, pre-consumer steel is assumed.
- In the cases where steel is procured directly by a steel manufacturer, the generated scrap is assumed to be remelted inside of the plant and the emissions associated with this is included in the dataset.
- Additional spillage in value chains for steel procured by other wholesalers are assumed to be below cut-off due to no additional processing being required when that wholesaler has procured the material.
- Supplier E in China is assumed to have a 5% spillage.

Cut-off rules:

The cut-off criteria are in accordance with the EN 15804 standard, therefore a maximum of 1% of the renewable and non-renewable primary energy use and max 1% of the total mass input of a specific unit are excluded. For a full module, the combined cut-off of all unit processes do not exceed 5%. Particular care should be taken for materials or processes can cause significant emissions to air, water or soil for any of the declared LCIA categories.

In this study, the following flows are deemed to be below cut-off:

- Packaging material for steel product as it represents less than 0.5% of the total product weight
- Difference between S235 and S355 steel as the only difference is 0,01% C content.

Allocation:

Allocation is performed according to the allocation hierarchy in EN 15804 chapter 6.4.3.2, that is:

Step 1 – Avoid allocation by dividing the unit processes into sub-processes or expanding the product system to include additional functions.

Step 2 – Partitioning the inputs and outputs of the system between its different products or functions in a way that reflects the underlying physical relationships between them. Examples of this is mass or energy.

Step 3 – Partitioning the inputs and outputs of the system between its different products or functions in a way that reflects other relationships between them. Examples of this is economic value.

Allocation procedures for A1-A3

A3 flows occurring at the site owned by Stalia and for material sent to painting, mass allocation was used.

Allocation procedure for pre-consumer scrap steel

The pre-consumer scrap steel was divided through economic allocation according to the table below:

Steel	**Timeframe**	**Average value** (USD/Metric ton)	**Economic allocation**
Primary steel	Jan 2022-Dec 2022	959.25	85%
Recycled steel	Jun 2022 – Apr 2023	170.11	15%

For primary steel, data was retrieved from an online source (Focus Economics, 2023) where the average price for hot rolled coil steel during 2022 was used. Data for recycled steel was also taken from an online source (MEPS International, 2009). The average price for recycled steel is represented by the ferrous scrap price between June 2022 and April 2023, which was presented in EUR/metric ton. For converting to USD/metric ton, the average exchange rate for 2022 was taken (Exchange Rates, 2022).

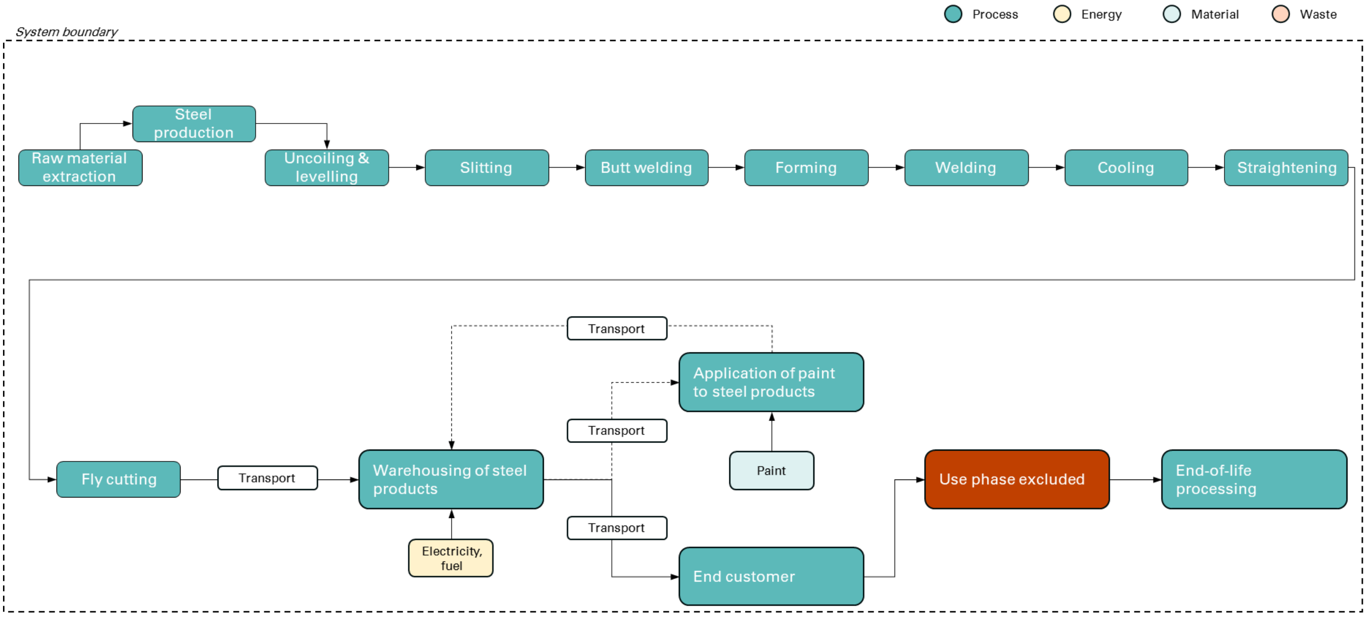
Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	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	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	EU	EU	SE	ND	ND	ND	ND	ND	ND	ND	ND	SE	SE	SE	SE	SE
Specific data used	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%																-
Variation – sites	**Supplier E**: -10% **Supplier F**: -35% **Supplier G**: +7%																-

X = declared, ND = Not declared, EU = European Union, SE = Sweden

Description of production activities:

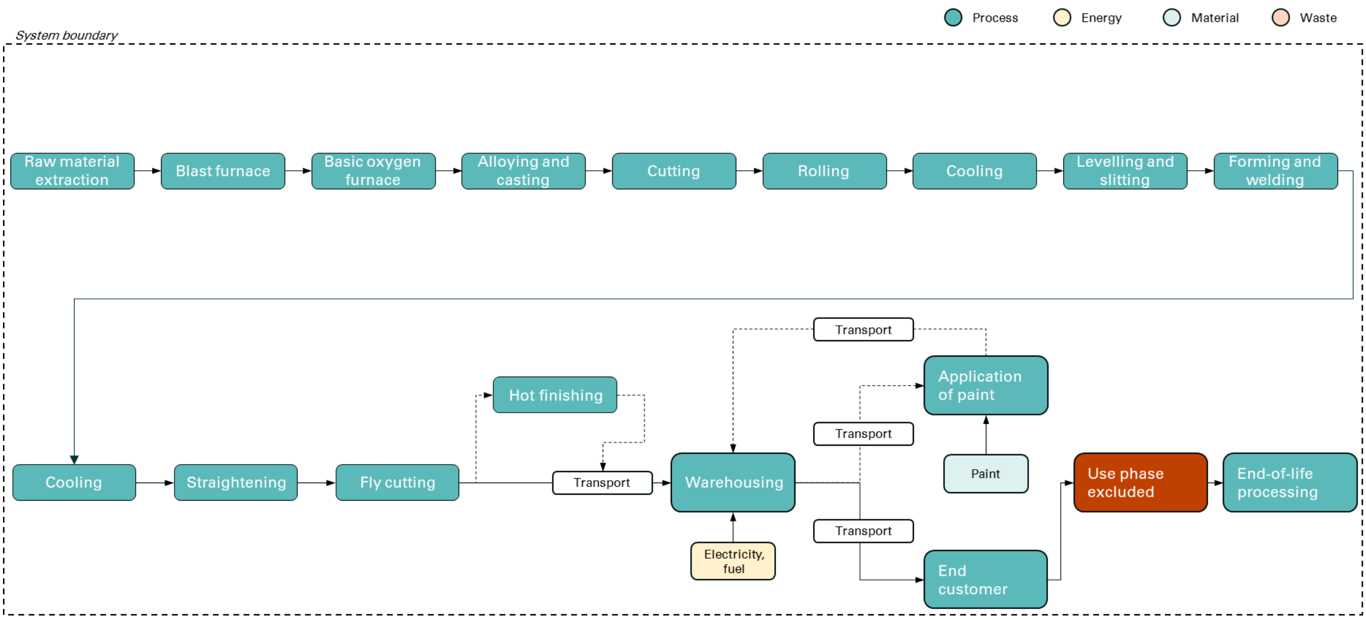
Stalia AB purchases Steel structural hollow sections (hot-formed) from three different suppliers (China, France, and wholesaler in Sweden). The following figure represents the modelling of supplier in China (supplier E).



1. Raw materials are extracted and transported to manufacturing facility
2. Steel coils are produced at unknown location and transported to Supplier Es facility (steel assumed to be produced in China with blast furnace)
3. Steel coils are uncoiled and levelled before slitting process to shape steel into desired dimensions
4. The steel is then butt welded and proceeds to be formed into a hollow section before being welded to close the form
5. The steel structural hollow section is cooled with water and straightened to ensure it does not deform through the added stress from prior treatment
6. The steel structural hollow section is cut through fly cutting to get final dimensions, and after quality inspection, they are packaged and prepared for transportation
7. The steel structural hollow sections are transported from the steel manufacturing site to Stalia AB facility in Halmstad, Sweden
8. When the steel structural hollow sections arrive at the Stalia AB facility, they are stored in a warehouse, where internal operations represent the energy use for the warehouse as well as internal transportation.
9. Some steel structural hollow sections have paint applied to them depending on customer order. This is done by an external party situated in Halmstad. After paint has been applied, the steel structural hollow sections is transported back to Stalia AB.
10. The steel structural hollow sections are then transported to end customer either with paint applied or non-painted.
11. Use phase is not modelled

12. End-of-life is modelled using relevant generic datasets representative of the region, in this case Sweden

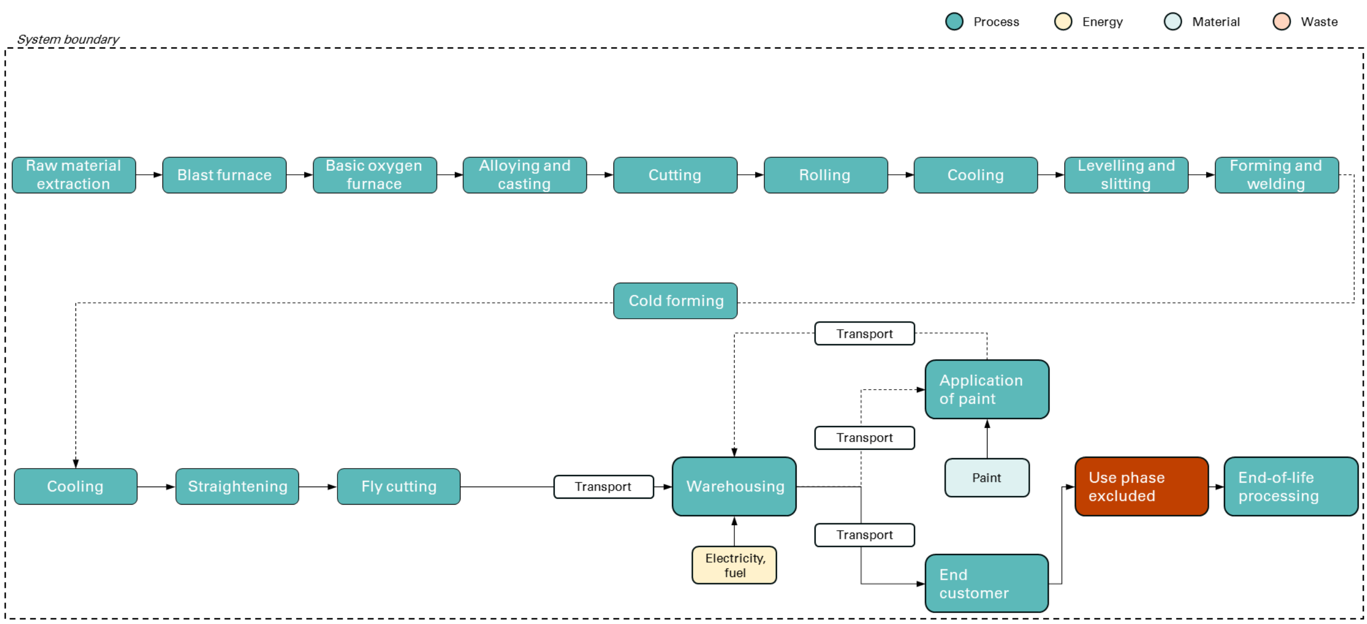
Stalia AB purchases steel structural hollow section (hot-formed) from a supplier in France (supplier F). The figure below shows the modelled process.



1. Raw materials are extracted and transported to manufacturing facility
2. Liquid iron is produced by continuous feed of coke, sinter (made from iron ore through sinter plant), and lime in a blast furnace at supplier site in Lexy, France
3. Liquid iron is transported to a basic oxygen furnace in the facility, where oxygen is blown into the molten iron to reduce carbon content and scrap metal is added for temperature control
4. Alloying elements are added to adjust chemical composition and tapped into a steel ladle for casting
5. The liquid steel is brought to a continuous caster in a ladle. In the caster, the liquid steel passes through a mould while cooling and is cut into length to semi-finished steel products
6. The semi-finished products are re-heated to 1 200°C, and steel scale is removed before flattening the steel to required dimensions and cooled
7. From the hot-rolling process, the steel is assumed to be levelled and slitted into desired dimensions of the structural hollow section
8. The steel is then formed and welded into the structural hollow section shape before cooling. It is then straightened to ensure it does not deform through the added stress from prior treatment
9. The steel structural hollow section is cut through fly cutting to get final dimensions, and after quality inspection, they are packaged and prepared for transportation

10. The steel structural hollow sections are transported from the steel manufacturing site to Stalia AB facility in Halmstad, Sweden
11. When the steel structural hollow sections arrive at the Stalia AB facility, they are stored in a warehouse, where internal operations represent the energy use for the warehouse as well as internal transportation.
12. Some steel structural hollow sections have paint applied to them depending on customer order. This is done by an external party situated in Halmstad. After paint has been applied, the steel structural hollow sections is transported back to Stalia AB.
13. The steel structural hollow sections are then transported to end customer either with paint applied or non-painted.
14. Use phase is not modelled
15. End-of-life is modelled using relevant generic datasets representative of the region, in this case Sweden

Stalia AB also purchases steel structural hollow sections from a wholesaler in Sweden (supplier G). Since the amount of purchased steel product from manufacturer is not known (only the total amount from the wholesaler is known), a conservative and generic modelling approach is applied. This process is modelled according to the figure below:



1. Raw materials are extracted and transported to manufacturing facility
2. Liquid iron is produced by continuous feed of coke, sinter (made from iron ore through sinter plant), and lime in a blast furnace at an average European site (defined in dataset)
3. Liquid iron is transported to a basic oxygen furnace in the facility, where oxygen is blown into the molten iron to reduce carbon content and scrap metal is added for temperature control

4. Alloying elements are added to adjust chemical composition and tapped into a steel ladle for casting
5. The liquid steel is brought to a continuous caster in a ladle. In the caster, the liquid steel passes through a mould while cooling and is cut into length to semi-finished steel products
6. The semi-finished products are re-heated to 1 200°C, and steel scale is removed before flattening the steel to required dimensions and cooled
7. From the hot-rolling process, the steel is assumed to be levelled and slitted into desired dimensions of the structural hollow section
8. The steel is then formed and welded into the structural hollow section shape before cooling (some steel goes through the process of cold forming to enhance certain properties of the structural hollow section). It is then straightened to ensure it does not deform through the added stress from prior treatment
9. The steel structural hollow section is cut through fly cutting to get final dimensions, and after quality inspection, they are packaged and prepared for transportation
10. The steel plates are transported from the steel manufacturing site to wholesaler in Halmstad Sweden, before being transported to Stalia AB facility in Halmstad, Sweden
11. When the steel structural hollow sections arrive at the Stalia AB facility, they are stored in a warehouse, where internal operations represent the energy use for the warehouse as well as internal transportation.
12. Some steel structural hollow sections have paint applied to them depending on customer order. This is done by an external party situated in Halmstad. After paint has been applied, the steel structural hollow sections is transported back to Stalia AB.
13. The steel structural hollow sections are then transported to end customer either with paint applied or non-painted.
14. Use phase is not modelled
15. End-of-life is modelled using relevant generic datasets representative of the region, in this case Sweden

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Pre-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Steel structural hollow sections (hot-formed) from Supplier E	764	0	0	0
Steel structural hollow sections (hot-formed) from Supplier F	114	0	36.20	0
Steel structural hollow sections (hot-formed) from Supplier G	122	0	0	0
TOTAL, weighted average	1 000	0	4.13	0

Packaging materials	Weight, kg	Weight-% (versus the product)
None included		

The product does not contain any substances of very high concern (SVHC).

Results of the environmental performance indicators

The results for A1-A3 should not only be analyzed at face value without considering the impacts represented by module C.

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.

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.

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	2.63E+03	1.51E+02	1.12E+00	9.66E+00	2.65E+01	9.62E-01	-9.84E+02
GWP-biogenic	kg CO_2 eq.	4.38E+00	4.43E-02	2.92E-04	9.45E-03	9.30E-02	6.56E-04	6.10E+00
GWP-luluc	kg CO_2 eq.	1.52E+00	1.40E-01	1.24E-04	4.61E-03	3.83E-02	5.66E-04	1.26E+00
GWP-total	kg CO_2 eq.	2.63E+03	1.51E+02	1.12E+00	9.68E+00	2.67E+01	9.64E-01	-9.76E+02
ODP	kg CFC 11 eq.	4.89E-05	2.25E-06	1.74E-08	2.05E-07	4.11E-07	2.67E-08	-2.47E-05
AP	mol H^+ eq.	1.08E+01	3.85E+00	1.01E-02	3.07E-02	2.90E-01	6.95E-03	-5.24E-02
EP-freshwater	kg P eq.	1.10E-01	7.00E-04	3.94E-06	7.53E-05	1.18E-03	9.00E-06	-4.99E-02
EP-marine	kg N eq.	2.19E+00	8.83E-01	4.68E-03	1.04E-02	6.61E-02	2.65E-03	-6.99E-01
EP-terrestrial	mol N eq.	2.50E+01	9.80E+00	5.10E-02	1.11E-01	7.56E-01	2.86E-02	-8.21E+00
POCP	kg NMVOC eq.	1.19E+01	2.72E+00	1.51E-02	4.59E-02	2.26E-01	9.96E-03	-5.15E+00
ADP-minerals&metals*	kg Sb eq.	1.87E-02	1.80E-04	3.81E-07	3.02E-05	1.60E-03	1.28E-06	9.66E-03
ADP-fossil*	MJ	2.69E+04	1.81E+03	1.43E+01	1.33E+02	3.51E+02	2.30E+01	-7.58E+03
WDP*	m^3	6.74E+02	4.34E+00	2.92E-02	5.32E-01	4.27E+00	1.01E+00	1.28E+02

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.*

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Particulate matter	Disease inc.	1.86E-04	4.29E-06	2.79E-07	6.05E-07	3.78E-06	1.48E-07	-6.03E-05
Ionising radiation**	kBq U235 eq	3.35E+01	4.46E-01	2.92E-03	6.69E-02	9.35E-01	6.08E-03	8.27E+01
Ecotoxicity, freshwater*	CTUe	8.91E+03	9.52E+02	7.27E+00	7.05E+01	2.24E+02	1.13E+01	2.43E+04
Human toxicity, cancer*	CTUh	1.56E-05	7.19E-08	3.34E-10	4.27E-09	3.95E-08	3.93E-10	-4.44E-06
Human toxicity, non-cancer*	CTUh	6.18E-05	9.43E-07	7.36E-09	1.24E-07	1.91E-06	1.11E-08	-1.07E-05
Land use*	Pt	8.11E+03	1.64E+02	9.55E-01	7.94E+01	6.24E+02	4.56E+01	-1.35E+02

** 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.*

*** This impact category deals mainly with the eventual impact of low dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure, not due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon, and from some construction materials is also not measured by this indicator.*

Potential environmental impact for 1 000 kg of Steel structural hollow section (hot-formed) – GWP-GHG

This table presents global warming potential according to IPCC 2013 GWP 100a without any biogenic uptake.

Results per functional or declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	2.53E+03	1.48E+02	1.09E+00	9.44E+00	2.61E+01	9.26E-01	-9.29E+02

Resource use indicators

Results per functional or declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2.52E+03	1.57E+01	8.13E-02	2.07E+00	5.45E+01	1.95E-01	1.65E+03
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.52E+03	1.57E+01	8.13E-02	2.07E+00	5.45E+01	1.95E-01	1.65E+03
PENRE	MJ	2.86E+04	1.92E+03	1.52E+01	1.42E+02	3.73E+02	2.44E+01	-8.07E+03
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.86E+04	1.92E+03	1.52E+01	1.42E+02	3.73E+02	2.44E+01	-8.07E+03
SM	kg	4.13E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	1.49E+01	1.85E-01	1.24E-03	2.21E-02	1.39E-01	2.45E-02	-1.84E+00
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

This table presents all the waste that is not treated within the system boundary. Since ecoinvent is used as the database, treatment processes of all wastes generated in the system are included within the system boundaries except for those inputs where other EPDs are used.

Results per functional or declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Output flow indicators

This table presents flows that exit the system boundary that are not waste.

Results per functional or declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.50E+02	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

LCIA differences between painted and non-painted products

As this EPD is a worst-case scenario type EPD, there are no impacts that increases for a non-painted product. The largest difference in one LCIA category between a painted and a non-painted product is 23%.

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