

# Environmental Product Declaration



In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

## Surface-treated steel screw for indoor use Surface-treated steel screw for outdoor use Västsvensk Byggskruv AB



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## Programme information

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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): Construction Products PCR 2019:14 version 1.2 Valid until: 2024-12-20
PCR review was conducted by: The Technical Committee of the International EPD® System. Chair: Claudia A. Peña. Contact via <a href="mailto:info@environdec.com">info@environdec.com</a>
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: Martyna Mikusinska, Sweco Environment AB, <a href="mailto:Martyna.Mikusinska@sweco.se">Martyna.Mikusinska@sweco.se</a> .  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

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

EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

## Company information

Owner of the EPD:

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Description of the organisation:

Västsvensk Byggskruv AB (VSB) was founded in 1984. Since then, the company has been continually growing and is today considered one of the market leaders in Sweden. VSB's goal is to provide the highest quality products on the field with a high level of punctuality in terms of delivery deadlines, and where back orders are an exception to the rule. VSB are continuously working on product development and quality monitoring where identifying time-minimising and work-saving innovations is the objective.

Product-related or management system-related certifications:

VSB is an ISO 9001 certified company that aims to deliver top-quality screws and attachments. To be in a position to manage fast deliveries and avoid back orders VSB should hold large volumes in stock and, in the eyes of the customer, be the supplier with the most comprehensive knowledge about attachments.

VSB is also ISO 14001 certified and has its own environmental policy, which means that VSB must assume their environmental responsibility in full and continuously strive to minimise the company's environmental impact.

All VSB's articles are registered in and meet the requirements for Swedish Basta, Sunda Hus and Byggsvarubedömningen. This means that the products apply to the limits for the substances included in the REACH candidate list.

## Product information

### Product name:

Surface treated steel screw for indoor use and surface treated steel screw for outdoor use.

### Product identification:

The screw for indoor use is electro-galvanized. The screw for outdoor use is surface treated with VSB's surface treatment Zincotech AU or Zincotech Ag.

### Product description:

Screw types included in this EPD are among others Drywall-, Chipboard-, Round washer head-, Decking- and Woodscrews. The screw for indoor use meets the requirements of climate class 1 (EN 1995-1-1), the screw for outdoor use meets the requirements of climate class 3 (EN 1995-1-1) and is classified in corrosivity class C4.

### Product variations:

The declared products in this EPD are surface treated steel screw for indoor and outdoor use. Since the result for the different screws differs less than 10% between any of the declared environmental performance indicators, the results are product specific to a representative screw. The outdoor screw is the product with the higher impact in the majority of the indicators and has highest turnover for the different screws which is why the result for the outdoor screw is presented in this EPD. The two screws constitute about 85% of VSB's total product volume.

The difference between the screws is the temperature at which they are hardened in manufacturing and the surface treatment. The outdoor screw is more elastic to withstand movement in outdoor structures, the outdoor screw also needs a surface treatment for rust protection.

## LCA information

The complete Life Cycle Assessment report (Lindroth, 2022) is available to the EPD verifier.

This is a product specific EPD for Surface-treated steel screw for indoor and outdoor use from Västsvensk Byggskruv AB. The result for the different screws differs less than 10% between any of the declared environmental performance indicators. The outdoor screw is the product with the higher impact in the majority of the indicators and has highest turnover for the different screws which is why the result for the outdoor screw is presented in this EPD.

<b>Declared Unit</b>	1 kg screw
<b>The function</b>	The screw types included in this EPD are used in construction works. Among other the screw types are used as Drywall-, Chipboard-, Round washer head-, Decking- and Woodscrews. The screw for indoor use meets the requirements of climate class 1 (EN 1995-1-1), the screw for outdoor use meets the requirements of climate class 3 (EN 1995-1-1) and is classified in corrosivity class C4.
<b>Product group classification</b>	CPC 42944
<b>Scope</b>	Cradle to gate, with module A4, C2, C4, and module D. The studied system includes the production of raw material (A1), its transport (A2) and manufacturing (A3). Transport to client (A4) is also included. Installation (A5) and deconstruction (C1) is not included because it does not have relevant environmental impact. The use phase (B) is not included due to the different functionalities. The end of life (C) is included and the potential secondary effects of reuse and recycling (D).
<b>Time</b>	Data represents the year 2021.
<b>Manufacturing Site</b>	Brämhult
<b>Geographical Area</b>	Components mainly comes from Asia, manufacturing and disposal is represented by Sweden.
<b>Compliant with</b>	The methodology used follows the General program instructions for the International EPD System (EPD International, 2021b), PCR 2019:14 version 1.2 (EPD International, 2021a).  These are in line with the international standards for LCA that apply to this context: EN15804:2012+A2:2019 (CEN, 2019), ISO 14025 (ISO, 2006a), ISO 14040 (ISO, 2006b), and 14044 (ISO, 2006c).
<b>Cut-Off Rules</b>	The procedure below is followed for the exclusion of inputs and outputs according to the EN 15804:2012+ A2:2019 standard:  Cut-offs in this study has been: (A2) EU-pallets, due to them being reused. (A3) Transport for consumables with significantly small amount. (A3) Consumables with significantly small amount. (D) Potentially benefit from recycling waste from consumables in A3.
<b>Allocation</b>	Allocation to coproducts (if any), is made by weight. It is most suitable because the environmental impact is mostly related to the weight and the products are made from mostly the similar material.  Mass allocation between VSB's different products has been made for the energy, consumables and waste for their manufacturing.
<b>Key assumptions</b>	Overall assumptions: Transport by truck within Sweden is assumed to be with a truck 16-32 tons, EURO6. Other truck transports are assumed to be with trucks 16-32 tons, EURO5.

	<p>(A1) Amount of recycled steel in screw is 11%. (6-16% given)</p> <p>(A3) Packaging of the screws occurs by three options. An average based on turnover of these options has been used in the assessment.</p> <p>(A4) Distribution to client is on average 249 km.</p> <p>(A5) Any environmental impact due to installation is assumed to fall under cut-off. (The allocated environmental impact to the screw for installation of a construction is not significant.)</p> <p>(C1) Any impacts from demolition is assumed to fall under cut-off. (The allocated environmental impact to the screw for demolition of a construction is not significant.)</p> <p>(C2) Transport of 50 km to waste treatment.</p> <p>(C3) Waste processing is considered but is assumed to fall under cut-off. (The allocated environmental impact to the screw for demolition of a construction is not significant.)</p> <p>(C4) As the majority of screws are distributed in Sweden, a waste scenario in Sweden has been adopted.</p>
<b>Background Data</b>	Ecoinvent 3.8 - allocation, Cut off.
<b>Foreground Data -primary</b>	Weight of articles and composition of raw materials. Suppliers' location for transport. Packaging, rest materials, electricity, heat and waste. Customers distance for distribution to client. Disposal scenario. Period of data collection 2022.
<b>Foreground Data -specific</b>	Manufacturing of screws by suppliers in Taiwan. Manufacturing at Västsvensk Byggskruv at Brämhult. Period of data collection 2021.
<b>Electricity data</b>	Electricity consumption in the A3 module is VSB's own production of solar energy and Swedish residual mix for electricity.
<b>LCA software</b>	SimaPro 9.3.0.3

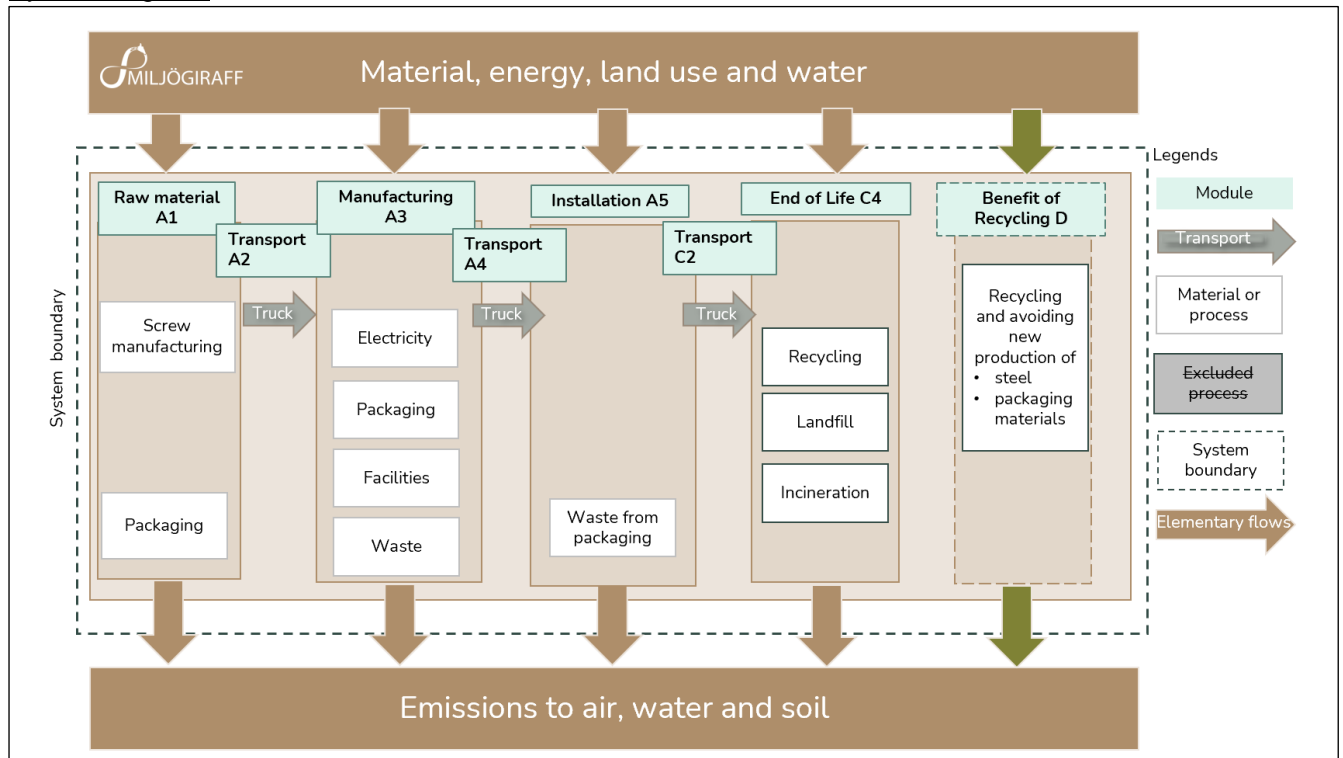
	Product stage		Construction process stage			Use stage							End of life stage				Resource recovery stage		
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	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	N.D	N.D	N.D	N.D	N.D	N.D	N.D	x	X	X	X	X		
Geography	GLO	GLO	SWE	SWE	SWE	N.D	N.D	N.D	N.D	N.D	N.D	N.D	SWE	SWE	SWE	SWE	SWE		
Specific data used	>90%					-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation – products	<10%					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	No variation.					-	-	-	-	-	-	-	-	-	-	-	-	-	-

Modules declared: (X = included, ND = not declared). Below is system boundaries for the model of the product system.

## System diagram

The EPD follows the cradle-to-grave system boundaries as defined in the PCR. That means that all processes needed for raw material extraction, manufacturing, transport, and end-of-life are included in the study. See the system diagram below for information about included modules.

### System diagram:



### More information:

VSB's supply chain that is assessed extends from their suppliers of packaging materials, consumables, but above all from the supplier of screws in Asia, to VSB's operations in Brämhult for packaging and distribution. Hence, screw production in Asia falls under A1 Raw material. In this study, all suppliers have been contacted to obtain specific information about their products.

### Disclaimers about results for the environmental impact.

1. Note that the LCIA results are relative expressions, which means that they do not predict impacts on category endpoints or the exceeding of thresholds, safety margins or risk.
2. "Ionising Radiation" – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.
3. Abiotic resources (elements and fossil fuels) The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.



## Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Steel	1	11%	
TOTAL	1	11%	

Packaging materials	Weight, kg	Weight-% (versus the product)
Small cardboard box (50% recycled)	0,051	5%
Lid, plastic box (0% recycled)	0,007	1%
Box, plastic box (70% recycled)	0,009	1%
Large cardboard box (50% recycled)	0,000087	0%
Tape	0,00014	0%
Band	0,000044	0%
TOTAL	0,068	7%

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
No SVHC over 0,1%	-	-	-

## Environmental Information

An requirement to EN 15804 is that the EPD results of modules A1-A3 shall be declared in aggregated form. This solves the problem that EN 15804 and ISO 21930 assign some processes (e.g., generation of electricity) to different modules. Although, this EPD has chosen to show separate results for A1-A3 with the disclaimer that they have been assign processes according to ISO 21930. The aggregated result for A1-A3 comply with both EN 15804 and ISO 21930.

### Potential environmental impact – mandatory indicators according to EN 15804

Indicator	Unit	Results per functional or declared unit								
		A1	A2	A3	Tot.A1-A3	A4	A5	C2	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	3,52E+00	1,43E-01	1,87E-01	3,85E+00	4,34E-02	2,24E-02	8,14E-03	7,43E-04	1,46E+00
GWP-biogenic	kg CO <sub>2</sub> eq.	-5,06E-02	-1,73E-05	-6,18E-02	-1,12E-01	3,75E-05	2,02E-02	7,03E-06	7,36E-07	5,49E-03
GWP-luluc	kg CO <sub>2</sub> eq.	3,47E-03	1,22E-04	4,07E-04	4,00E-03	1,74E-05	9,15E-07	3,26E-06	7,01E-07	-7,74E-04
GWP-total	kg CO <sub>2</sub> eq.	3,48E+00	1,43E-01	1,26E-01	3,75E+00	4,35E-02	4,25E-02	8,15E-03	7,44E-04	1,45E+00
ODP	kg CFC 11 eq.	1,78E-07	2,85E-08	1,47E-08	2,21E-07	1,01E-08	3,67E-10	1,89E-09	3,00E-10	-6,33E-08
AP	mol H <sup>+</sup> eq.	1,33E-02	3,83E-03	8,41E-04	1,80E-02	1,23E-04	1,25E-05	2,31E-05	6,98E-06	-5,25E-03
EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq.	5,37E-03	1,77E-05	2,11E-04	5,60E-03	8,74E-06	7,48E-07	1,64E-06	2,09E-07	-2,20E-03
EP-freshwater	kg P eq	1,75E-03	5,78E-06	6,88E-05	1,82E-03	2,85E-06	2,44E-07	5,34E-07	6,80E-08	-7,16E-04
EP-marine	kg N eq.	2,99E-03	8,67E-04	2,37E-04	4,10E-03	2,51E-05	5,73E-06	4,70E-06	2,43E-06	-1,26E-03
EP-terrestrial	mol N eq.	2,99E-02	9,66E-03	1,89E-03	4,14E-02	2,73E-04	5,44E-05	5,12E-05	2,66E-05	-1,33E-02
POCP	kg NMVOC eq.	1,31E-02	2,55E-03	5,39E-04	1,62E-02	1,05E-04	1,44E-05	1,97E-05	7,73E-06	-6,79E-03
ADP-minerals&metals*	kg Sb eq.	2,49E-05	2,62E-07	7,74E-07	2,59E-05	1,54E-07	7,72E-09	2,89E-08	1,69E-09	-2,07E-06
ADP-fossil*	MJ	3,85E+01	1,85E+00	3,70E+00	4,41E+01	6,58E-01	1,58E-02	1,23E-01	2,07E-02	1,51E+01
WDP*	m <sup>3</sup>	6,09E-01	4,05E-03	6,74E-02	6,80E-01	2,00E-03	4,42E-04	3,76E-04	9,33E-04	-3,32E-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.

**Potential environmental impact – additional mandatory and voluntary indicators**

Results per functional or declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	A5	C2	C4	D
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	3,41	0,14	0,19	3,74	0,043	0,022	0,0081	0,001	-1,39
<i>Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017</i>										

**Use of resources**

Results per functional or declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	A5	C2	C4	D
PERE	MJ	1,78	0,016	0,58	2,38	0,0094	0,00076	0,0018	0,00018	-0,77
PERM	MJ	0	0	0,98	0,98	0	0	0	0	0
PERT	MJ	1,78	0,016	1,56	3,35	0,0094	0,00076	0,0018	0,00018	-0,77
PENRE	MJ	41,00	1,96	3,61	46,58	0,6990	0,017	0,13	0,022	-15,87
PENRM	MJ.	0,079	0	0,307	0,39	0	0	0	0	0
PENRT	MJ	41,08	1,96	3,92	46,96	0,70	0,017	0,13	0,022	-15,87
SM	kg	0,11	0	0,032	0,14	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
FW	m <sup>3</sup>	0,019	0,00020	0,0024	0,022	0,00011	0,000028	0,000021	0,000023	-0,0053
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									

<sup>1</sup> The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## Waste production and output flows

### Waste production

Indicator	Unit	Results per functional or declared unit								
		A1	A2	A3	Tot.A1-A3	A4	A5	C2	C4	D
Hazardous waste disposed	kg	0	0	0	0	0	0	0	0	0
Non-hazardous waste disposed	kg	0	0	0	0	0	0	0	0	0
Radioactive waste disposed	kg	0	0	0	0	0	0	0	0	0

### Output flows

Indicator	Unit	Results per functional or declared unit								
		A1	A2	A3	Tot.A1-A3	A4	A5	C2	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0,10	0	0	0,10	0	0,049	0	0,86	0
Materials for energy recovery	kg	0	0	0	0	0	0,022	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0

## Information on biogenic carbon content

Results per functional or declared unit		
BIOTENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0,023

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>.

## References

- CEN. (2019). *EN 15804:2012+A2:2019 (E)*.
- EPD International. (2021a). *CONSTRUCTION PRODUCTS PCR 2019:14 VERSION 1.2*.
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