Environmental Product Declaration

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

Surface-treated steel screws for outdoor use

from

Heco Nordiska

EPD of multiple products, based on the average results of the product group

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products, based on the average results of the product group
EPD registration number:	EPD-IES-0025961:001
Version date:	2025-11-26
Validity date:	2030-11-25
	An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

This EPD covers multiple products:

Wood screw; Decking screw; Anchor screw; Heco Invisible screw; Construction screw and different Fastening screws

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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Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *Construction products 2019:14, version 2.0.1, valid until 2030-04-07, UN CPC code: 42944*
PCR review was conducted by: *The Technical Committee of the International EPD® System.* *See www.environdec.com for a list of members.* *Review chair: Rob Rouwette (chair), Noa Meron (cochair).* *The review panel may be contacted via the Secretariat www.environdec.com/contact*

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: *Hüdai Kara PhD, Metsims Sustainability Consulting, Oxford, U.K.* Approved by: 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 published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: Heco Nordiska AB
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Description of the organisation:
Heco has a long history in the fastening industry, with roots dating back to the late 1980s. For more than three decades, the company has developed into a trusted supplier of screws and fastening solutions for the Nordic construction market.

Since 2020, Heco has been part of Volati AB and the Salix Group, strengthening its position and enabling continued growth. The headquarters and operations remain in Hillerstorp, just north of Värnamo in Sweden.

Heco offer a complete range of screws – including wood screws, drywall screws, board screws, sheet metal screws, drilling screws, and farmer screws – as well as fittings and a wide selection of accessories.

Today, Heco's team of around 50 colleagues work with purchasing, sales, packaging in boxes and bags, and surface treatment of fasteners. The coating process is carried out with great precision and is recognized as one of Heco's strongest capabilities.

Product-related or management system-related certifications:
Product meets the requirements for corrosivity class C4 according to SS-EN ISO 12944-2.

PRODUCT INFORMATION

Product name: Surface-treated steel screws for outdoor use
Product identification: All products included are surface-treated steel screws for outdoor use. These are: Wood screw; Decking screw; Anchor screw; Heco Invisible screw; Construction screw; and different Fastening screws which meets the requirements for corrosivity class C4 according to SS-EN ISO 12944-2.

Visual representation of the product:

UN CPC code: 42944

Product description: Heco's surface-treated screws for outdoor use are steel screws with Protect 4 surface-treatment used in the construction and carpentry industry for materials such as wood, drywall, chipboard etc. Products are available in different screw types.

Name and location of production site(s): Heco Nordiska AB in Hillerstorp, Sweden, and Heco's suppliers in Asia.

Multiple products: All products included in this EPD are steel screws for outdoor use with protect 4 surface-treatment. This EPD represents different types of screws which all have the same composition and share the same geographical scope and production site. Due to this, and with the declared unit being 1 kg of Screw, there is no difference between the screw types nor the results for the different types of steel screws in this EPD.

The different screw types included in this EPD are shown in the table below.

Surface-treated steel screws for outdoor use
Wood screw
Decking screw
Anchor screw
Heco Invisible screw
Construction screw
Fastening screw

CONTENT DECLARATION

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Steel	1	0%	0%	0
TOTAL	1	0%	0%	0

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Cardboard	0,034	3,4%	0,015
Plastic	0,047	4,7%	0
TOTAL	0,081	8,1%	0,015

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product or declared unit
-	-	-	-

LCA INFORMATION

Declared unit:
1 kg Screw. Conversion factor for the product is 1 kg per kg

Reference service life:
Not applicable

Time representativeness:
The collected data is representative of the year 2024 and was obtained directly from the supplier.

Geographical scope:
The supply of raw material A1 steel is Global & Rest-of-World, the transport A2 is modelled for Global, Rest-of-World & Europe, and the manufacturing in module A3 is located in Asia for Heco's suppleires and at Heco in Sweden. Module C and D are for Sweden.

Database(s) and LCA software used: Ecoinvent 3.11 and SimaPro Craft 10.1.

LCIA method:
The LCIA method follows the standard for Construction Products EN 15804:2012+A2:2019/AC:2021. EN 15804:2012+A2:2019/AC:2021 uses the impact categories and characterization factors of the LCIA methods used in Environmental Footprint 3.1 (EF 3.1), with the only difference that biogenic

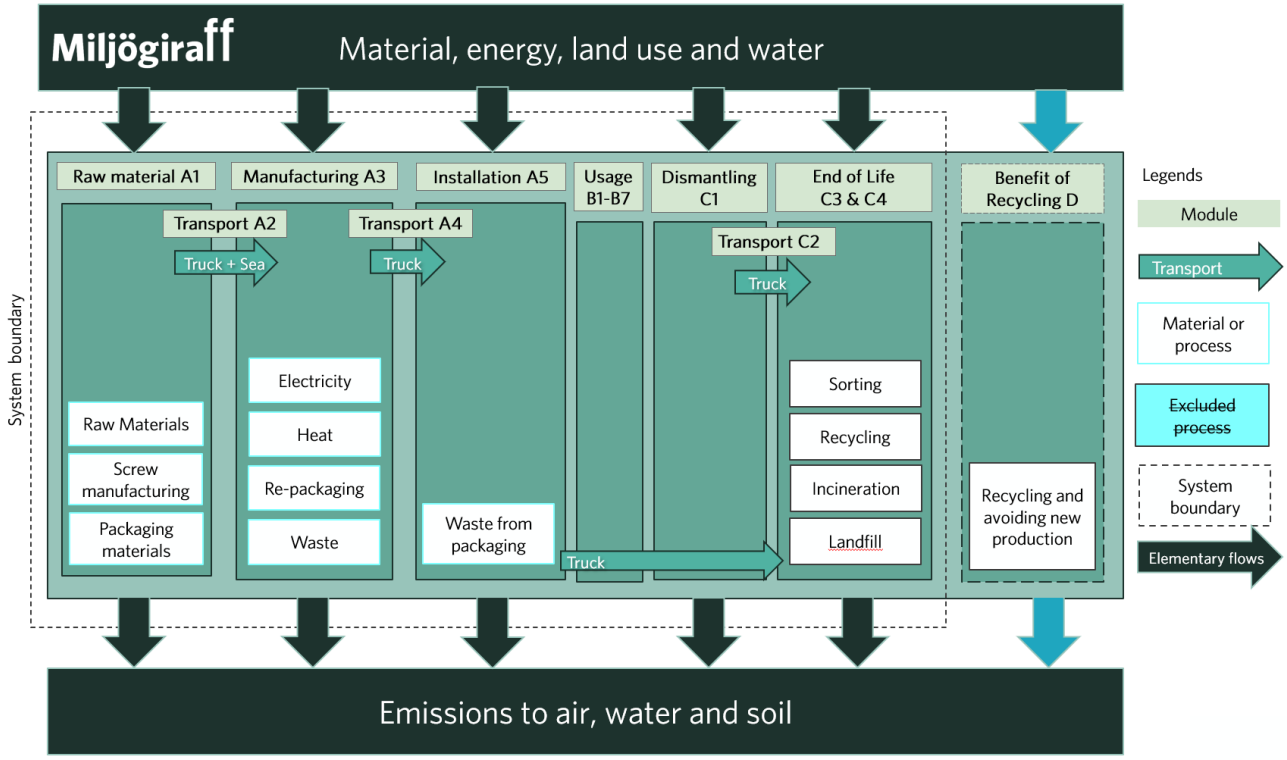
carbon dioxide uptake is calculated as -1 and biogenic carbon dioxide emissions as +1, where EF 3.1 calculates this as 0 and 0, respectively.

Cut-off criteria:
The cut-off criteria established by the PCR is 1% of all material and energy flows to a single unit process and 5% of total inflows (mass and energy) per module. No cut-offs exceeding this limit have been made.

In this study, the infrastructure and capital goods are included in the LCA analysis since it is not possible within reasonable effort to subtract the data on infrastructure/capital goods.

Description of system boundaries:
Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and A4-A5 and B1-B7). However, since the product is a passive product, there will be no environmental impact during the use phase.

Process flow diagram:



More information:
(A1-A3) Heco do not have any inhouse production of screws but purchase their surface treated screws from various suppliers in Asia. The production of screws at Heco's suppliers requires raw material, consumables and energy, whilst also generating waste. The finished surface treated screws are then packaged in different packaging alternatives and sent to Heco by sea and truck.

Heco's storage of screws is located in Hillerstorp, Sweden, where a majority of products arrive in finished packaging ready for distribution. A small amount of screws arrives in bulk in boxes on wood pallet which is repackaged into cardboard or plastic packaging alternatives. The packaging declared in product content declaration is only considering the distribution packaging to end-customer. Apart from

the repackaging waste, which is assumed to be 100% incinerated, no other waste of significance occurs at Heco.

Heco purchase certified electricity from 100% hydropower and the climate footprint (GWP-GHG) is 0,00435 kg CO2/kWh.

Manufacturing data such as electricity consumption has been allocated based on mass.

(A4) The finished products are transported 266 km by diesel trucks.

(A5) Installation of the product is assumed to occur in a way that has no environmental impact, e.g. by hand. What is considered for the installation is the waste treatment of the packaging materials that comes with the product, which follows the end-of-life treatment in module C.

(B1-B7) It is assumed that there are no significant environmental aspects during the use of the product.

(C1-C4) After use the product is transported to waste processing. In the C module, default values provided by the PCR 2019:14 v.2.0.1 were used for demolition/deconstruction (C1) as no specific data was obtained. The default values for transport distances to waste treatment (C2) were also used, 80 km for materials not to be incinerated and 130 km for materials to be incinerated.

Since the majority of customers exists in Sweden, the relevant end-of-life scenario has been represented with a Swedish case.

For the waste treatment (C3), the steel is assumed to be 100% recycled. Thus, there is no additional 100% scenarios declared. The environmental impact from recycling is not considered following the cut-off approach applied.

(D) Module D accounts for the potential environmental benefits or burdens resulting from material recycling and energy recovery during incineration.

Data quality summary
The EPD is based on data collected by Heco and their suppliers representing the production year 2024. The EPD is representative of the production of 1 kg Screw from Heco’s suppliers in Asia and at Heco in Sweden. The end-of-life stage of the EPD covers Sweden.

Primary data have been collected about manufacturing processes and is combined with representative secondary data from the ecoinvent database v.3.11. The quality of the relevant data used for the EPD using EN 15804:2012+A2:2019, Annex E, E.1, is in terms of geographical representativeness good, technical representativeness good and fair, and for time representativeness very good, good and poor. The reason for using the datasets with poor time representativeness is that no more recent datasets are available in the database.

Modules declared, geographical scope, share of primary 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	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	GLO	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Share of primary data	30%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Declaration of data sources, reference years, data categories, and share of primary data:

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Raw material - Steel (Pig Iron)	Database	Ecoinvent v3.11	2024	Secondary data	0%
Manufacturing processes	Collected data, Database	EPD owner & Suppliers, Ecoinvent v3.11	2024	Primary data, Representative secondary data	25%
Transport	Database	Ecoinvent v3.11	2024	Primary data	5%
Other processes	Collected data, Database	EPD owner, Suppliers, Ecoinvent v3.11	2024	Representative secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					30%

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

ENVIRONMENTAL PERFORMANCE

LCA results of the product – main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per 1 kg Screw										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	**5,6E+00**	5,4E-02	1,7E-01	0,0E+00	4,0E-04	1,5E-02	3,4E-03	0,0E+00	-1,7E+00
GWP-fossil	kg CO_2 eq.	**5,6E+00**	5,4E-02	1,1E-01	0,0E+00	4,0E-04	1,5E-02	3,4E-03	0,0E+00	-1,7E+00
GWP-biogenic	kg CO_2 eq.	**-5,1E-02**	1,2E-05	5,6E-02	0,0E+00	4,4E-08	3,2E-06	1,8E-06	0,0E+00	1,7E-03
GWP-luluc	kg CO_2 eq.	**1,1E-02**	1,8E-05	2,3E-06	0,0E+00	4,1E-08	5,0E-06	8,2E-06	0,0E+00	-6,2E-04
ODP	kg CFC 11 eq.	**5,0E-08**	1,2E-09	1,1E-10	0,0E+00	5,9E-12	3,3E-10	5,2E-11	0,0E+00	-7,1E-09
AP	mol H^+ eq.	**2,9E-02**	1,2E-04	3,8E-05	0,0E+00	3,6E-06	4,9E-05	3,0E-05	0,0E+00	-5,9E-03
EP-freshwater	kg P eq.	**2,4E-04**	4,0E-07	5,3E-08	0,0E+00	1,4E-09	1,1E-07	1,4E-08	0,0E+00	-8,4E-05
EP-marine	kg N eq.	**6,3E-03**	2,7E-05	1,7E-05	0,0E+00	1,7E-06	1,6E-05	1,4E-05	0,0E+00	-1,3E-03
EP-terrestrial	mol N eq.	**7,0E-02**	3,0E-04	1,7E-04	0,0E+00	1,8E-05	1,8E-04	1,5E-04	0,0E+00	-1,5E-02
POCP	kg NMVOC eq.	**2,3E-02**	1,8E-04	5,0E-05	0,0E+00	5,4E-06	7,4E-05	4,6E-05	0,0E+00	-5,3E-03
ADP-minerals&metals*	kg Sb eq.	**3,5E-05**	1,8E-07	1,7E-08	0,0E+00	1,4E-10	5,1E-08	2,5E-09	0,0E+00	7,1E-07
ADP-fossil*	MJ	**6,6E+01**	7,7E-01	7,0E-02	0,0E+00	5,2E-03	2,2E-01	5,3E-02	0,0E+00	-1,9E+01
WDP*	m^3	**1,9E+00**	3,0E-03	7,3E-04	0,0E+00	1,1E-05	8,4E-04	2,2E-04	0,0E+00	-1,2E-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 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 end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3). Negative values in Module D represent potential net benefits from material recycling and energy recovery beyond the system boundary.
Note: Biogenic carbon in packaging is balanced in A1–A3.

** Disclaimer: 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.*

Additional mandatory and voluntary impact category indicators

Results per 1 kg Screw										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	**5,6E+00**	5,4E-02	1,1E-01	0,0E+00	4,0E-04	1,5E-02	3,4E-03	0,0E+00	-1,7E+00
PM	disease inc.	**4,3E-07**	4,0E-09	4,3E-10	0,0E+00	1,0E-10	1,2E-09	8,5E-10	0,0E+00	-1,3E-07
IR[2]	kBq U-235 eq	**8,9E-02**	3,3E-04	7,4E-05	0,0E+00	8,6E-07	9,3E-05	3,5E-04	0,0E+00	-3,0E-02
ETP – FW*	CTUe	**3,0E+01**	1,0E-01	2,6E-01	0,0E+00	2,8E-04	2,9E-02	2,6E-03	0,0E+00	-4,6E+00
HTP – C*	CTUh	**4,5E-09**	9,0E-12	7,2E-12	0,0E+00	4,1E-14	2,6E-12	3,7E-13	0,0E+00	-2,5E-09
HTP – NC*	CTUh	**4,5E-08**	4,8E-10	3,0E-10	0,0E+00	6,4E-13	1,3E-10	7,0E-12	0,0E+00	-2,9E-09
Land use, SQP*	Pt	**1,9E+01**	4,6E-01	3,4E-02	0,0E+00	3,4E-04	1,3E-01	5,3E-03	0,0E+00	-5,6E+00
Acronyms	GWP-GHG: Global Warming Potential, Greenhouse Gases, PM: Particulate Matter, IRP: Ionizing Radiation - Human Health, ETP-FW: Ecotoxicity Potential – Freshwater, HTP-C: Human Toxicity Potential – Cancer, HTP-NC: Human Toxicity Potential – Non-Cancer, SQP: Soil Quality Potential Index									

Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017

Disclaimer: The results of the impact categories land use, human toxicity (cancer), human toxicity, non-cancer 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. Negative values in Module D represent potential net benefits from material recycling and energy recovery beyond the system boundary.

** 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.*

[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.
[2] 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.

Resource use indicators

Results per 1 kg Screw										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	**7,4E+00**	1,3E-02	2,4E-03	0,0E+00	3,3E-05	3,5E-03	6,4E-03	0,0E+00	-1,4E+00
PERM	MJ	**5,3E-01**	0,0E+00	-5,3E-01	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
PERT	MJ	**7,9E+00**	1,3E-02	-5,3E-01	0,0E+00	3,3E-05	3,5E-03	6,4E-03	0,0E+00	-1,4E+00
PENRE	MJ	**6,9E+01**	8,1E-01	7,5E-02	0,0E+00	5,5E-03	2,3E-01	5,6E-02	0,0E+00	-2,0E+01
PENRM	MJ	**1,5E+00**	0,0E+00	-1,5E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
PENRT	MJ	**7,0E+01**	8,1E-01	-1,4E+00	0,0E+00	5,5E-03	2,3E-01	5,6E-02	0,0E+00	-2,0E+01
SM	kg	**0,0E+00**	0,0E+00	0,0E+00	0,0E+00	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	0,0E+00	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	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
FW	m^3	**3,1E-02**	1,2E-04	2,0E-04	0,0E+00	3,8E-07	3,2E-05	5,7E-06	0,0E+00	-6,9E-03
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									

Disclaimer: Negative values in Module D represent potential net benefits from material recycling and energy recovery beyond the system boundary.

Waste indicators

Results per 1 kg Screw										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Non-hazardous waste disposed	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Radioactive waste disposed	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Output flow indicators

Results per 1 kg Screw										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Material for recycling	kg	0,08	0,00	0,03	0,00	0,00	0,00	1,00	0,00	0,00
Materials for energy recovery	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Exported energy, electricity	MJ	0,04	0,00	0,38	0,00	0,00	0,00	0,00	0,00	0,00
Exported energy, thermal	MJ	0,10	0,00	0,88	0,00	0,00	0,00	0,00	0,00	0,00

Additional LCA results

100% Recycling Scenario for modules A5, C1-C4 & D

Mandatory impact category indicators according to EN 15804

Results per 1 kg Screw							
Indicator	**Unit**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	5,9E-02	4,0E-04	1,5E-02	3,4E-03	0,0E+00	-1,8E+00
GWP-fossil	kg CO_2 eq.	3,1E-03	4,0E-04	1,5E-02	3,4E-03	0,0E+00	-1,8E+00
GWP-biogenic	kg CO_2 eq.	5,6E-02	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
GWP-luluc	kg CO_2 eq.	1,6E-06	4,1E-08	5,0E-06	8,2E-06	0,0E+00	-2,8E-05
ODP	kg CFC 11 eq.	6,7E-11	5,9E-12	3,3E-10	5,2E-11	0,0E+00	-1,0E-08
AP	mol H^+ eq.	1,1E-05	3,6E-06	4,9E-05	3,0E-05	0,0E+00	-6,0E-03
EP-freshwater	kg P eq.	2,2E-08	1,4E-09	1,1E-07	1,4E-08	0,0E+00	-8,4E-05
EP-marine	kg N eq.	3,7E-06	1,7E-06	1,6E-05	1,4E-05	0,0E+00	-1,3E-03
EP-terrestrial	mol N eq.	4,0E-05	1,8E-05	1,8E-04	1,5E-04	0,0E+00	-1,5E-02
POCP	kg NMVOC eq.	1,6E-05	5,4E-06	7,4E-05	4,6E-05	0,0E+00	-5,6E-03
ADP-minerals&metals*	kg Sb eq.	1,0E-08	1,4E-10	5,1E-08	2,5E-09	0,0E+00	5,3E-07
ADP-fossil*	MJ	4,5E-02	5,2E-03	2,2E-01	5,3E-02	0,0E+00	-2,0E+01
WDP*	m^3	1,8E-04	1,1E-05	8,4E-04	2,2E-04	0,0E+00	-1,4E-01
GWP-GHG[3]	kg CO2 eq.	3,1E-03	4,0E-04	1,5E-02	3,4E-03	0,0E+00	-1,8E+00
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, GWP-GHG: Global Warming Potential for Greenhouse Gases						

Disclaimer: 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 end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3). Negative values in Module D represent potential net benefits from material recycling and energy recovery beyond the system boundary.
Note: Biogenic carbon in packaging is balanced in A1–A3.

** Disclaimer: 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.*

[3] 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 CO2 is set to zero.

100% Incineration Scenario for modules A5, C1-C4 & D

Mandatory impact category indicators according to EN 15804

Results per 1 kg Screw							
Indicator	**Unit**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	1,7E-01	4,0E-04	2,5E-02	3,4E-03	1,8E-02	-1,2E-01
GWP-fossil	kg CO_2 eq.	1,2E-01	4,0E-04	2,5E-02	3,4E-03	1,8E-02	-1,2E-01
GWP-biogenic	kg CO_2 eq.	5,6E-02	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
GWP-luluc	kg CO_2 eq.	2,5E-06	4,1E-08	8,2E-06	8,2E-06	8,7E-06	-6,5E-04
ODP	kg CFC 11 eq.	1,3E-10	5,9E-12	5,4E-10	5,2E-11	3,7E-10	-1,1E-09
AP	mol H^+ eq.	4,6E-05	3,6E-06	7,9E-05	3,0E-05	1,0E-04	-4,6E-04
EP-freshwater	kg P eq.	6,3E-08	1,4E-09	1,8E-07	1,4E-08	2,7E-07	-5,6E-06
EP-marine	kg N eq.	2,0E-05	1,7E-06	2,6E-05	1,4E-05	3,8E-05	-1,0E-04
EP-terrestrial	mol N eq.	2,1E-04	1,8E-05	2,9E-04	1,5E-04	4,2E-04	-1,3E-03
POCP	kg NMVOC eq.	6,0E-05	5,4E-06	1,2E-04	4,6E-05	1,4E-04	-4,1E-04
ADP-minerals&metals*	kg Sb eq.	1,9E-08	1,4E-10	8,3E-08	2,5E-09	5,0E-08	-3,3E-08
ADP-fossil*	MJ	7,9E-02	5,2E-03	3,5E-01	5,3E-02	2,9E-01	-2,0E+00
WDP*	m^3	8,8E-04	1,1E-05	1,4E-03	2,2E-04	7,8E-03	-1,7E-02
GWP-GHG[4]	kg CO2 eq.	1,2E-01	4,0E-04	2,5E-02	3,4E-03	1,8E-02	-1,2E-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, GWP-GHG: Global Warming Potential for Greenhouse Gases						

Disclaimer: 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 end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3). Negative values in Module D represent potential net benefits from material recycling and energy recovery beyond the system boundary.
Note: Biogenic carbon in packaging is balanced in A1–A3.

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[4] 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 CO2 is set to zero.

100% Landfill Scenario for modules A5, C1-C4 & D

Mandatory impact category indicators according to EN 15804

Results per 1 kg Screw							
Indicator	**Unit**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	6,0E-02	4,0E-04	1,5E-02	3,4E-03	6,8E-03	-1,1E-01
GWP-fossil	kg CO_2 eq.	3,6E-03	4,0E-04	1,5E-02	3,4E-03	6,8E-03	-1,1E-01
GWP-biogenic	kg CO_2 eq.	5,6E-02	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
GWP-luluc	kg CO_2 eq.	1,7E-06	4,1E-08	5,0E-06	8,2E-06	3,6E-06	-5,3E-06
ODP	kg CFC 11 eq.	8,4E-11	5,9E-12	3,3E-10	5,2E-11	1,8E-10	-4,0E-10
AP	mol H^+ eq.	1,4E-05	3,6E-06	4,9E-05	3,0E-05	4,9E-05	-3,6E-04
EP-freshwater	kg P eq.	2,5E-08	1,4E-09	1,1E-07	1,4E-08	6,3E-08	-5,1E-06
EP-marine	kg N eq.	5,1E-06	1,7E-06	1,6E-05	1,4E-05	1,9E-05	-7,5E-05
EP-terrestrial	mol N eq.	5,6E-05	1,8E-05	1,8E-04	1,5E-04	2,1E-04	-9,4E-04
POCP	kg NMVOC eq.	2,2E-05	5,4E-06	7,4E-05	4,6E-05	7,4E-05	-3,3E-04
ADP-minerals&metals*	kg Sb eq.	1,1E-08	1,4E-10	5,1E-08	2,5E-09	9,4E-09	4,7E-08
ADP-fossil*	MJ	5,7E-02	5,2E-03	2,2E-01	5,3E-02	1,6E-01	-1,1E+00
WDP*	m^3	2,2E-04	1,1E-05	8,4E-04	2,2E-04	6,7E-03	-6,4E-03
GWP-GHG[5]	kg CO2 eq.	3,6E-03	4,0E-04	1,5E-02	3,4E-03	6,8E-03	-1,1E-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, GWP-GHG: Global Warming Potential for Greenhouse Gases						

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[5] 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 CO2 is set to zero.

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
PCR	Product Category Rules
c-PCR	Complementary Product Category Rules
CEN	European Committee for Standardization
CPC	Central product classification
GHG	Greenhouse Gas
PEF	Product Environmental Footprint
Environmental Impact Indicators (EN 15804)	
GHG	Greenhouse Gas
GWP	Global Warming Potential (kg CO_2 eq.)
GWP-fossil	Global Warming Potential from fossil sources (kg CO_2 eq.)
GWP-biogenic	Global Warming Potential from biogenic sources (kg CO_2 eq.)
GWP-luluc	Global Warming Potential from land use and land use change (kg CO_2 eq.)
GWP-total	Total Global Warming Potential (kg CO_2 eq.)
GWP-GHG	Global Warming Potential for greenhouse gases (kg CO_2 eq.)
ODP	Ozone Depletion Potential (kg CFC-11 eq.)
AP	Acidification Potential (mol H^+ eq.)
EP	Eutrophication Potential
EP-freshwater	Freshwater eutrophication potential (kg P eq.)
EP-marine	Marine eutrophication potential (kg N eq.)
EP-terrestrial	Terrestrial eutrophication potential (mol N eq.)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq.)
ADP	Abiotic Depletion Potential
ADP-minerals&metals	Abiotic depletion potential for non-fossil resources (kg Sb eq.)
ADP-fossil	Abiotic depletion potential for fossil resources (MJ)
WDP	Water Deprivation Potential (m^3)
Resource Use Indicators	
PERE	Renewable primary energy (excluding as raw materials) (MJ)
PERM	Renewable primary energy used as raw materials (MJ)
PERT	Total renewable primary energy (MJ)
PENRE	Non-renewable primary energy (excluding as raw materials) (MJ)
PENRM	Non-renewable primary energy used as raw materials (MJ)
PENRT	Total non-renewable primary energy (MJ)
SM	Use of secondary material (kg)
RSF	Use of renewable secondary fuels (MJ)
NRSF	Use of non-renewable secondary fuels (MJ)
FW	Use of net fresh water (m^3)
HW	Hazardous Waste (disposed) (kg)
NHW	Non-Hazardous Waste (disposed) (kg)
RW	Radioactive Waste (disposed) (kg)
Output Flow Indicators	
CFR	Components for Reuse (kg)
MR	Material for Recycling (kg)
MER	Materials for Energy Recovery (kg)
EEE	Exported Energy, Electricity (MJ)

EET	Exported Energy, Thermal (MJ)
Lifecycle Stages / Modules	
A1	Raw material supply
A2	Transport
A3	Manufacturing
A4	Transport to site
A5	Construction/Installation
B1	Use
B2	Maintenance
B3	Repair
B4	Replacement
B5	Refurbishment
B6	Operational energy use
B7	Operational water use
C1	Deconstruction/Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse-Recovery-Recycling potential
Other Relevant Terms	
SVHC	Substances of Very High Concern
EC No.	European Community Number
CAS No.	Chemical Abstracts Service Number
MJ	Megajoule
kg	Kilogram
m^3	Cubic Meter
NMVOC	Non-Methane Volatile Organic Compounds
Sb eq.	Antimony Equivalents
P eq.	Phosphorus Equivalents
N eq.	Nitrogen Equivalents
CFC-11 eq.	Chlorofluorocarbon-11 Equivalents
CO_2 eq.	Carbon Dioxide Equivalents
kg C	Kilograms of Carbon
kg CO_2 eq.	Kilograms of Carbon Dioxide Equivalent
ND	Not Declared

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VERSION HISTORY

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INTERNATIONAL EPD SYSTEM
www.environdec.com