ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Simpson Strong-Tie Europe
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SST-20240583-IBC1-EN
Issue date	04/03/2025
Valid to	03/03/2030

Connectors

Simpson Strong-Tie

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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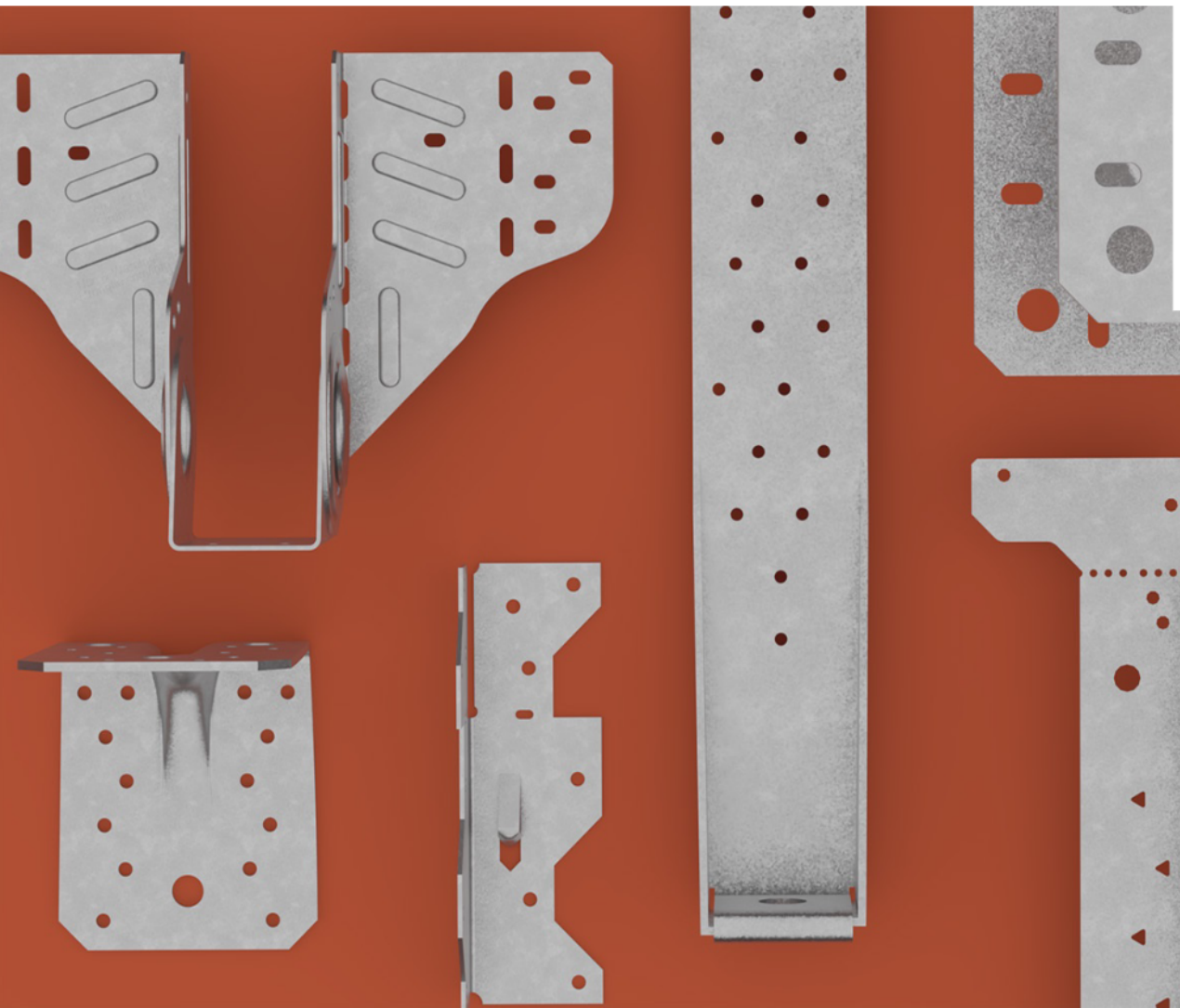

1. General Information

Simpson Strong-Tie

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-SST-20240583-IBC1-EN

This declaration is based on the product category rules:

Structural steels, 01/08/2021
(PCR checked and approved by the SVR)

Issue date

04/03/2025

Valid to

03/03/2030

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Connectors

Owner of the declaration

Simpson Strong-Tie Europe
Le Moulin des Ardillers -
85400 Sainte Gemme La Plaine
France

Declared product / declared unit

1 kg of installed Connectors

Scope:

This underlying LCA study cover's Simpson Strong-Tie's Connector products manufactured at their facilities in Tamworth (UK), Boulstrup (Denmark), Saint Gemme (France), Thuin (Belgium), and Bad Nauheim (Germany). This EPD represents the average Connector group of products.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR			
Independent verification of the declaration and data according to ISO 14025:2011			
☐	internally	☒	externally

Mrs Kim Allbury,
(Independent verifier)

2. Product

2.1 Product description/Product definition

This EPD concerns Simpson Strong-Tie steel and stainless-steel connectors used for timber structures. The connectors (hangers, holdowns, hurricane ties, angles, straps, caps, bases, etc.) are fabricated from steel (either rolls or flat sheets) and fully formed either through a manual fabrication process utilizing bent presses, lasers, and/or automatic punching tool or through an automated process utilizing a die in multiple stages press to manufacture the connectors. These connectors are typically installed with mechanical fasteners such as screws, pins, nails or dowels. They are used to connect timber elements together like studs, ledgers, joists, beams, posts, etc. These connectors also attach timber elements to steel, concrete or masonry. The described connectors are made of steel or stainless steel.

These are products approved by European or national building authorities as well as constructive products without approval. For the placing of the product on the market in the European Union/European Free Trade Association/EU/EFTA) (with the exception of Switzerland) the *Regulation (EU) No. 305/2011* (CPR) applies. The product needs a declaration of performance taking into consideration the respective ETA and the CE-marking.

For the application and use the respective national provisions apply.

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For the application and use the respective national provisions apply.

Products with exclusively national regulation:
The respective national regulations at the place of use apply to the use of the product, in Germany for example the building regulations of the federal states, and the technical regulations based on these regulations.
There are no building code requirements for constructive products.

2.2 Application

In the following text, timber covers: Solid Timber, Glulam, CLT, LVL or other engineered wood/ wood-based products such as plywood or OSB.
The products are used to connect timber-based elements to other timber-based elements or steel elements or concrete/masonry elements. They are generally connected to supporting and supported elements using mechanical fasteners such as: bolts, dowels, nails, screws or chemical, plastic, or mechanical anchors.

2.3 Technical Data

Structural data for connectors can be found in the corresponding approvals, declaration of performance and technical drawings.

Constructional data

Name	Value	Unit
Density	7800	kg/m^3
Modulus of elasticity	210000	N/mm^2
Coefficient of thermal expansion	10 - 20	$10^{-6}K^{-1}$
Thermal conductivity	45 - 55	W/(mK)
Melting point	1370	°C
Grade of material according to the delivery standards	EN10346:2015 / ASTM A653/A653M or EN10088:2014	-

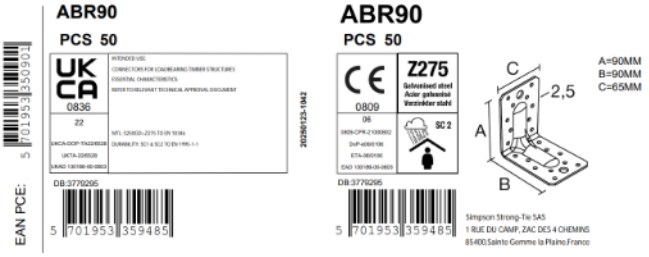
Product according to the CPR, based on a hEN:
Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to

- *EN 14545:2008, Timber structures — Connectors — Requirements*

Product according to the CPR, based on an ETA:
Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to:

- *ETA-06/0106, 2021, Simpson Strong-Tie Angle Brackets*
- *ETA-06/0270, 2024, Simpson Strong-Tie Joist Hangers*
- *ETA-07/0053, 2018, Simpson Strong-Tie Cantilever brackets*
- *ETA-07/0245, 2018, Simpson Strong-Tie Joist End Connector and Concealed Beam Hangers*
- *ETA-07/0285, 2021, Simpson Strong-Tie Hold Downs & Post Bases*
- *ETA-08/0053, 2018, Simpson Strong-Tie Skewed and Sloped joist hangers*
- *ETA-10/0440, 2020, Simpson Strong-Tie Roof Connectors*
- *ETA-17/0554, 2023, Simpson Strong-Tie Joist Connectors*
- *ETA-20/1071, 2020, Simpson Strong-Tie Miscellaneous Brackets*
- *ETA-20/1071, 2020, Simpson Strong-Tie Truss Hanger*
- *ETA-21/0482, 2021, Simpson Strong-Tie Universal brackets, Purlin anchors, Joist anchors*
- *ETA-23/0570, 2023, Simpson Strong-Tie CCS Connector*

2.4 Delivery status



The information on the product properties and quantity information are clearly visible on the outside of the packaging. Connectors, for example, are delivered in packaging units of 1 to 500 connectors per box (with an average of around 50 units per box). For big connectors (e.g. ≥350 mm) there are no boxes.

2.5 Base materials/Ancillary materials

Connectors are usually made of the following materials: steel and stainless steel. Depending on the requirements and material, these are provided with a galvanic zinc coating.

Market Unit Construction are:
- Connectors made from Electrogalvanized Steel (approx. 10.66 %)
- Connectors made from Stainless Steel (approx. 84.76 %)
- Connectors made from Cold Roll and Hot Roll steel (approx. 4.57 %)

Steel
Steel is the term used to describe metallic alloys whose main component is iron, and which (unlike cast iron) can be processed by forming. All technical iron-carbon alloys whose carbon content is between 0 and 2.06 % can be designated as steel. The proportion of other elements must be significantly lower than that of iron.

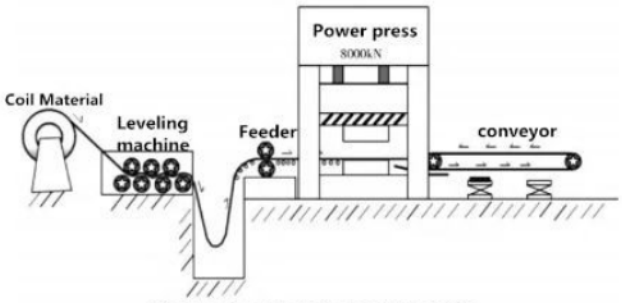
Stainless steel
According to *EN 10020*, a designation for alloyed or unalloyed steels with a special degree of purity, for example steels whose sulphur and phosphorus content (so-called iron companions) does not exceed 0.025 %. A frequently used alloy in the production of connectors, for example, is a steel of the variety 1.4301. This 1.4301 is an austenitic, corrosion-resistant 18/10 Cr-Ni steel which, due to its low carbon content, is resistant to intergranular corrosion after welding in sheet thicknesses up to 5 mm even without subsequent heat treatment. It is approved for thermal stress up to 600 °C.

Galvanic zinc coating
In electro galvanising, a comparatively thin zinc layer is deposited on the component surface in an electrolytic process. The properties of the applied zinc layer depend, among other things, on the current strength, the time of the current flow and the electrolyte solution used.

Lubricating
Environmentally friendly, aqueous suspensions, emulsions and dispersions are used as lubricating agents, which, depending on the area of application, include paraffins, polymers or waxes. Some lubricants also contain small amounts of alcohol.

This product/article/at least one partial article contains substances listed in the *candidate list (ECHA 2016)* exceeding 0.1 percentage by mass: no
This product/article/at least one partial article contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the *candidate list (ECHA 2016)*, exceeding 0.1 percentage by mass: no
Biocide products were added to this construction product, or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) *Ordinance on Biocide Products No. 528/2012)*: no

2.6 Manufacture
To produce connectors, the following manufacturing process is mainly used nowadays:
The cold process on a multi-stage press. The raw material may be delivered as coiled and is uncoiled and straightened in the upstream equipment. Modern cold presses work in multiple stages, i.e., several operations are carried out in succession in one stroke, for example punching, folding, and bending.



Progressive automatic production line

Other connectors are manufactured from steel sheets. They are first punched on an automatic punching tool or cut with a laser cutting machine. They are then bent to achieve the final shape of the product.

In some cases, the products are manufactured using different components made from raw steel. The components are mechanically assembled or welded together. Then a layer of coating may be added.

2.7 Environment and health during manufacturing
The steels and production materials used for the manufacture of connectors are non-toxic and have no impact on humans and the environment or aquatic and terrestrial organisms. The vapours produced during the manufacturing process of the connectors are removed from the production sites by appropriate filter systems and ventilation systems and cleaned by filter systems. Strict safety regulations apply in the Simpson Strong-Tie manufacturing sites, e.g. wearing suitable work clothing as well as hearing protection. These preventive measures serve to minimise risks and prevent occupational accidents.
The Simpson Strong-Tie company has introduced an environmental management system and applies it to the development, production, testing and distribution of connectors and corresponding cold-formed parts.

2.8 Product processing/Installation
Connectors are used to connect timber-based elements together or with elements made of metal/masonry or concrete. Installation of connectors must follow the instructions given in approval/technical documentation from Simpson Strong-Tie. The characteristics values listed in the approval documentation may be expected in this condition.

The recommendations of the connectors must be observed.

2.9 Packaging
Cardboard/paper (EAK 15 01 01) is used for packaging. Waste products: Packaging materials are disposed of by specialized companies. For large orders, the connectors are shipped on returnable or disposable pallets.

2.10 Condition of use
No material change is expected for the connectors during use.

2.11 Environment and health during use
No negative effects on the environment or human health are known from connectors in the installed state.

2.12 Reference service life
Due to the wide range of applications, no reference service life is given. The expected service life of connectors generally depends on their use. The prevailing external influences can greatly affect the service life.
According to the European Technical Approval, the average

service life is > 50 years. However, much longer service lives are also known. It should be noted that the screws are used in accordance with the technical regulations. Some connectors (ZPRO) have a limited lifetime of 15 years in outdoor environment but 50 years indoors.

2.13 Extraordinary effects

Fire

Connectors meet the requirements of fire resistance class A1 and may be classified in resistance class A1 and class A1fl without testing in accordance with *European Commission Decision 96/603/EC*. In the area of fire protection, the following building material class according to *EN 13501-1* is complied with:

Fire protection

Name	Value
Building material class	A1 d0 S1

Water

Water usually has no effect on the connectors, as these are made of a corrosion-resistant stainless steel or have a surface coating (galvanisation).

Mechanical destruction

The mechanical destruction of connectors has no impact on the environment.

2.14 Re-use phase

Connectors can generally be dismantled again from all applications, and this be fed into the recycling process. Direct reuse would theoretically be possible but is not recommended.

2.15 Disposal

Connectors can be disposed of separately (by appropriate dismantling) or directly with the installed elements during demolition. These are fed into the recycling process in accordance with the applicable disposal guidelines. The waste code for connectors made of corrosion-resistant stainless steel is 170407 and for connectors made of steel 170405 (*EWC*).

2.16 Further information

Further information can be found at www.strongtie.eu or in the approvals, standards and specialist rules and installation guidelines already mentioned.

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 kg of installed connectors.

Declared unit and mass reference

Name	Value	Unit
Density	7800	kg/m^3
Declared unit	1	kg

All connectors go through a similar production process, with little variability in the manufacturing of various connector types. The background data for the average connector in the EPD is represented by geographical variability and regional differences in energy sources, raw material acquisition, and appropriate transport distances. The actual representation of the average connector production process can be considered high.

3.2 System boundary

Type of the EPD: cradle to gate - with options.
The environmental product declaration refers to the production stage (modules A1-A3), the installation phase (A4-A5), the End-of-Life (modules C1-C4) and credits and loads outside the system boundary (module D).

Module A1 to A3:
The product stage includes provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues during the product stage. These modules consider the manufacturing of system components/raw materials in particular metal parts, the transport to the production site and the assembly of the product under study. The impact of packaging materials is included.

Module A4:
The module considers 100 km of truck transport to the installation site.

Module A5:
No installation materials and energies are considered. Moreover, installation losses have not been accounted for, since such losses highly depend on site-specific factors. Benefits for potential avoided burdens due to energy substitution of electricity and thermal energy generation from the waste treatment of the packaging are declared in module D affecting only the rate of primary material (no secondary materials). Incineration with energy recovery has been used for plastics and paper.

Module C1 to C4:
The End-of-Life (EoL) stage is a mandatory information module. It starts when the product is replaced, dismantled or deconstructed from the building or construction works and does not provide any further function. It can also start at the end-of-life of the building, depending on the choice of the product's end-of-life scenario. This stage comprises:
Manual Dismantling (C1)
Transport to waste processing (C2)
Waste processing for reuse, recovery and/or recycling (C3)
Disposal (C4)

At EoL, materials are separated as far as possible for individual treatment after deinstallation, which only requires manual removal of Connectors and Fasteners (No loads in C1). Further dismantling and part separation of the product is manual as well and transportation to final disposal sites as 100 km by truck is considered (Module C2).

Module D:
Metals are assumed to reach the end of waste status directly at construction site. The treatment and credits for avoided primary production (for the net scrap amount only) are grouped to module D.

For the thermal and electrical energy generated in Modules A5 and C3 due to the thermal treatment of packaging and product waste, avoided burdens have been calculated by the inversion of the electricity grid mix and thermal energy from natural gas, using European datasets.

3.3 Estimates and assumptions

For electricity production, the European average dataset has been used for the Connectors as the product is a weighted average of multiple locations.

3.4 Cut-off criteria

No cut-off criteria are defined for this study. For the processes within the system boundary, all available energy and material flow data have been included in the model. In cases where no

matching life cycle inventories are available to represent a flow, proxy data have been applied based on conservative assumptions regarding environmental impacts.

3.5 Background data

The background data from *LCA FE 2024.1 DB* were used.

3.6 Data quality

As part of the update of the EPD, the data originally collected and checked for plausibility from 2023 was adopted. The primary data were provided by the company Simpson Strong-Tie The quality and representativeness of the collected data can therefore be considered high. The data quality of the background data used was rated as good in terms of technical, geographical and temporal representativeness. The majority of the background data used comes from the reference year 2023.

3.7 Period under review

The data basis of this LCA is based on data collected in 2023. The period under consideration is 12 months.

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

3.9 Allocation

The allocations details are as follows:

- Co-product allocation: There are no co-products within A1-A3. There is no co-product allocation in the LCA-model.
- Allocation of background data: If relevant, information about allocation procedure of single datasets is documented in the LCA FE online documentation: https://gabi.sphera.com/support/gabi
- Allocation in the foreground data: The overall production of Simpson Strong-Tie comprises of multiple products. Production data (e.g., energy) is allocated during the data collection and entered in the tool refer to the declared product. Allocation of the production data is done according to the total mass of product produced.
- Allocation of multi-input processes: The modules A1-A3 include end-of-life datasets (e.g., for landfill and incineration of waste) in which different products are treated together within a single process. The allocation procedures followed in these cases are based on a physical allocation of the mass flows and are documented in the LCA FE online documentation.
- Allocation for waste materials: The following allocation procedures for reuse, recycling and recovery are applied:
  - External treatment of production waste materials generates electricity and thermal energy via incineration processes, and material benefits for metal and plastic recycling. No energy benefits are taken. Material benefits from production waste recycling are declared in module D.
  - Incineration of packaging (module A5) are also included in the system; resulting benefits for thermal and electrical energy are declared in module D.
  - Material benefits from product recycling at its end of life (C3) are declared in module D.

  More details can be found in the accompanying LCA report.

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. The background database used is *LCA FE Version 2024.1*.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

There is no biogenic carbon content in the product. The biogenic content in the accompanying packaging is as follows:

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	0.0155	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Transport to the building site (A4)

Name	Value	Unit
Transport distance	100	km

CE-marked connectors are assumed to have a working lifetime of 50 years according to the technical approval.
No reference lifetime is given for non-CE marked connectors.

End of life (C1 - C4)

Name	Value	Unit
Collected separately waste type steel	1	kg
Collected as mixed construction waste	-	kg
Reuse	-	kg
Recycling	0.97	kg
Energy recovery	-	kg
Landfilling	0.03	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

The balance includes the end-of-life of the declared products at the end of the use phase. For net scrap resulting from the connectors, a credit is awarded in module D.

Name	Value	Unit
Collection Rate	95	%
Scrap Credit	0.92	kg

5. LCA: Results

the results of the indicators of impact assessment, resource use as well as waste and other output flows related to 1 kg of installed connectors are presented below:

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	MND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg Connectors

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
GWP-total	kg CO_2 eq	3.52E+00	7.72E-03	5.95E-02	0	7.45E-03	1.45E-02	-3.95E-01
GWP-fossil	kg CO_2 eq	3.57E+00	7.71E-03	2.73E-03	0	7.44E-03	1.4E-02	-3.95E-01
GWP-biogenic	kg CO_2 eq	-4.67E-02	2.05E-07	5.68E-02	0	1.98E-07	4.24E-04	6.35E-04
GWP-luluc	kg CO_2 eq	2.11E-03	4.46E-06	9.49E-07	0	4.3E-06	1.36E-06	-1.89E-04
ODP	kg CFC11 eq	4.68E-12	1.01E-15	7.06E-15	0	9.7E-16	2.03E-13	1.25E-12
AP	mol H^+ eq	1.59E-02	4.35E-05	1.59E-05	0	4.2E-05	7.35E-05	-9.03E-04
EP-freshwater	kg P eq	3E-06	4.04E-08	3.42E-09	0	3.9E-08	3.72E-08	-3.61E-08
EP-marine	kg N eq	3.13E-03	2.19E-05	6.02E-06	0	2.12E-05	3.39E-05	-2.19E-04
EP-terrestrial	mol N eq	3.4E-02	2.41E-04	7.41E-05	0	2.32E-04	3.69E-04	-2.37E-03
POCP	kg NMVOC eq	9.84E-03	4.09E-05	1.54E-05	0	3.94E-05	9.11E-05	-7.28E-04
ADPE	kg Sb eq	4.39E-05	1.06E-09	1.12E-10	0	1.03E-09	1.68E-09	-4.35E-09
ADPF	MJ	4.13E+01	1.05E-01	1.95E-02	0	1.01E-01	1.88E-01	-3.01E+00
WDP	m^3 world eq deprived	1.2E+00	4.69E-04	6.47E-03	0	4.53E-04	2.48E-03	-3.22E-03

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg Connectors

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
PERE	MJ	4.44E+00	4.53E-03	6.3E-01	0	4.37E-03	1.36E-01	5.27E-01
PERM	MJ	6.26E-01	0	-6.26E-01	0	0	0	0
PERT	MJ	5.06E+00	4.53E-03	4.49E-03	0	4.37E-03	1.36E-01	5.27E-01
PENRE	MJ	4.13E+01	1.05E-01	3.75E-02	0	1.01E-01	2.11E-01	-3.01E+00
PENRM	MJ	4.07E-02	0	-1.8E-02	0	0	-2.27E-02	0
PENRT	MJ	4.13E+01	1.05E-01	1.95E-02	0	1.01E-01	1.88E-01	-3.01E+00
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
FW	m^3	3.43E-02	1.53E-05	1.52E-04	0	1.47E-05	1.04E-04	-2.64E-04

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg Connectors

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
HWD	kg	7.26E-08	1.42E-11	9.54E-12	0	1.37E-11	2.72E-10	1.34E-09
NHWD	kg	3.17E-01	1.03E-05	1.61E-03	0	9.96E-06	1.55E-04	4.26E-02
RWD	kg	2.16E-04	2.71E-07	8.09E-07	0	2.62E-07	3.01E-05	4.77E-05
CRU	kg	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	9.7E-01	0
MER	kg	1.21E-02	0	3.64E-02	0	0	0	0
EEE	MJ	0	0	0	0	0	0	9.38E-02
EET	MJ	0	0	0	0	0	0	1.66E-01

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 kg Connectors

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
PM	Disease incidence	3.21E-07	2.65E-10	8.82E-11	0	2.56E-10	6.07E-10	-1.32E-08
IR	kBq U235 eq	5.86E-02	2.3E-05	1.27E-04	0	2.22E-05	4.95E-03	5.33E-03
ETP-fw	CTUe	1.01E+01	8.16E-02	9.8E-03	0	7.88E-02	5.45E-02	-4.5E-01
HTP-c	CTUh	1.83E-07	1.4E-12	4.65E-13	0	1.35E-12	3.23E-12	-6.19E-10
HTP-nc	CTUh	1.49E-08	3.18E-11	9.23E-12	0	3.06E-11	4.73E-11	5.45E-10
SQP	SQP	1.03E+01	2.04E-02	5.55E-03	0	1.97E-02	7.92E-02	2.78E-01

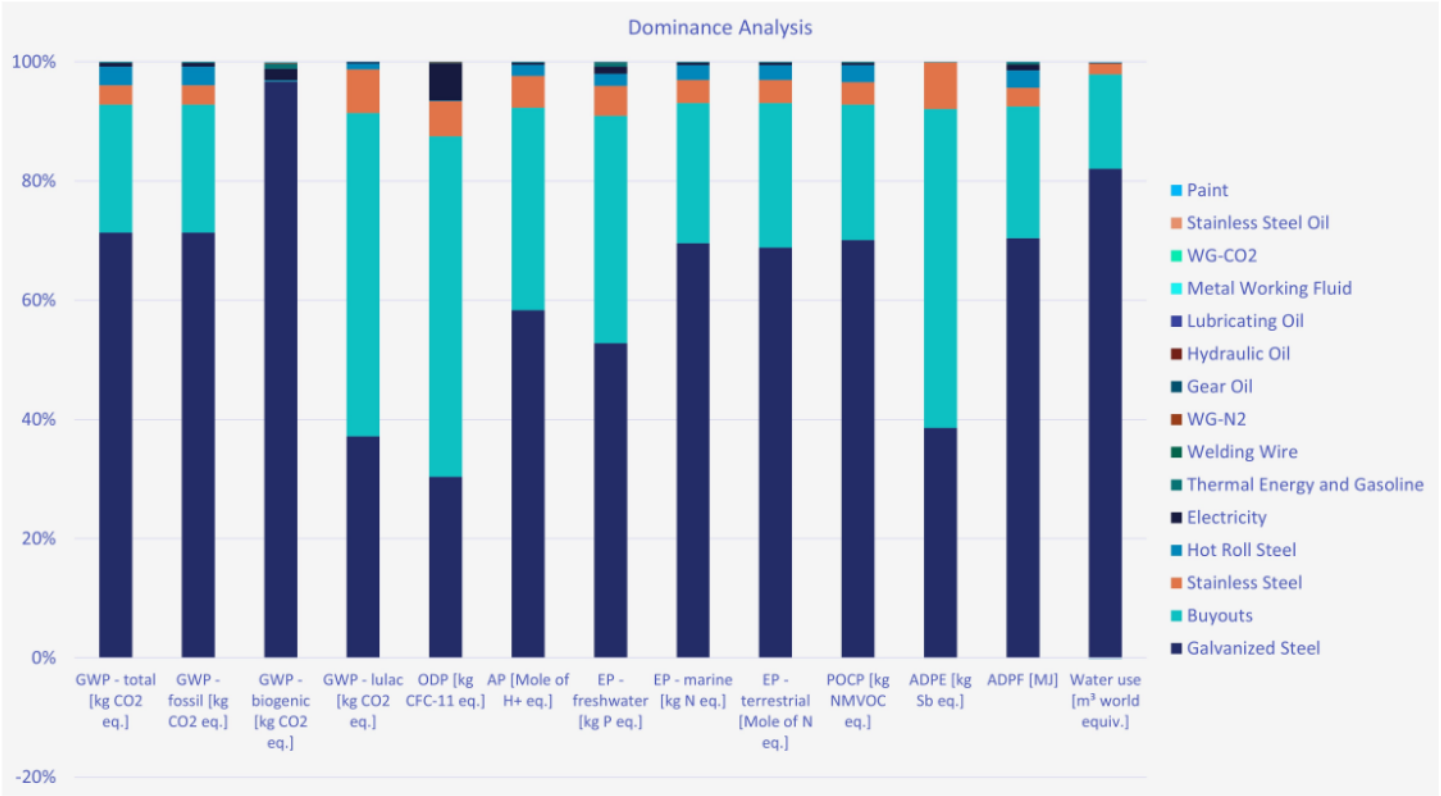
PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator "Potential Human exposure efficiency relative to U235". 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators "abiotic depletion potential for non-fossil resources", "abiotic depletion potential for fossil resources", "water (user) deprivation potential, deprivation-weighted water consumption", "potential comparative toxic unit for ecosystems", "potential comparative toxic unit for humans – cancerogenic", "Potential comparative toxic unit for humans - not cancerogenic", "potential soil quality index". The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

This EPD was created using a software tool.

6. LCA: Interpretation



The figure above shows the dominance analysis of module A1, which influences the overall results significantly.
The emissions from galvanized steel are of the utmost importance for the environmental profile of the product. Most impact categories including global warming potential, acidification, eutrophication, and water use are dominated by this. Buyouts are important as they dominate the ozone depletion potential, acidification potential, freshwater eutrophication and resource use.
Stainless steel also shows moderate impact for most impact categories.
The contribution of electricity is also moderate as it influences the ozone depletion potential.

7. Requisite evidence

No evidence according to PCR is required for this EPD.

8. References

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