ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	BEVER Gesellschaft für Befestigungsteile Verbindungselemente mbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-BEV-20250656-IBC1-EN
Issue date	30.03.2026
Valid to	29.03.2031

Wall connectors & anchor bolts

Bever GmbH

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

www.ibu-epd.com | https://epd-online.com

1. General Information

Bever GmbH

Programme holder

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

Declaration number

EPD-BEV-20250656-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

30.03.2026

Valid to

29.03.2031

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

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

Wall connectors & anchor bolts

Owner of the declaration

BEVER Gesellschaft für Befestigungsteile Verbindungselemente mbH
Auf dem Niedern Bruch 12
57399 Kirchhundem- Würdinghausen
Germany

Declared product / declared unit

1 kg of wall connectors and anchor bolts from BEVER

Scope:

This EPD is an average EPD and refers to a declared unit of 1 kilogram of wall connectors and connection anchors from BEVER, which are manufactured at the production site of BEVER Gesellschaft für Befestigungsteile Verbindungselemente GmbH in Kirchhundem (Germany). The data was collected on a plant-specific basis using current data from 2024 (Jan–Dec). 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

Dr. Martina Bender,
(Independent verifier)

2. Product

2.1 Product description/Product definition

The wall connectors and connection anchors are used to join two walls that meet at a 90° angle.
The wall connectors and connection anchors were developed to replace the labour-intensive process of interlocking the walls with bricks.
The wall connectors and connection anchors serve to increase structural stability and prevent cracking.
The wall connectors and connection anchors are made from stainless steel strip or galvanised steel strip. The items are produced by punching; the wall anchors are additionally angled at 90°.
Y-Nails are a special development designed exclusively for aerated concrete blocks. They serve only a temporary purpose and are intended to prevent two aerated concrete blocks placed one on top of the other from slipping. The following products form part of the BEVER product range for wall connectors and are included in this average EPD.
MV – Wall connectors in various lengths
PB – Wall connectors
PB – Connection anchors
ML – Connection anchors
PB – Building board anchors
Rigid wall anchors
Movable wall anchors
Y-Nails (special design for aerated concrete only; no Declaration of Performance required)
The rail into which the ML and PB connection anchors are hooked, as well as the dowels used for fixing the PB construction panel anchors and wall anchors, are not included in this EPD. Further details can be found in Section 2.2.

2.2 Application

The MV and PB wall connectors are inserted into the mortar joints on both sides. To do this, the joints must be at the same level.
If the wall to be butt-jointed has already been built, or if it is a concrete wall, or if the joints are not at the same level, connection anchors are used.
The ML and PB connection anchors are hooked onto a rail system fixed to the wall. On the other side, the anchors are embedded in the mortar joint.
The PB building board anchors and the wall anchors are fixed using dowels and are likewise embedded in the mortar joints on the other side.
The rail and the dowel fixings are not included in this EPD.
Y-Nails are used only with aerated concrete blocks. They consist of a corrugated, galvanised steel sheet that is driven into aerated concrete blocks. This is intended to prevent two aerated concrete blocks from slipping until the mortar has set.

2.3 Technical Data

The physical and mechanical properties apply in accordance with *EN 10088-3 – stainless steels for grades 1.4301, 1.4401/1.4404 and 1.4362*, and in accordance with *EN 10346 – continuously hot-dip galvanised* flat products made of steels for construction, or *EN 10152* – electrolytically galvanised cold-rolled flat steel products.

Constructional data

Name	Value	Unit
Density	7800	kg/m^3
Modulus of elasticity	193000	N/mm^2
Thermal conductivity	11	W/(mK)
Melting point	1390	°C

The technical specifications of the raw materials used comply with the relevant standards. The shaping of the raw materials during the production process into wall connectors and connection anchors does not result in any significant changes to the specified technical specifications.
For the placing of the product on the market in the EU/EFTA (with the exception of Switzerland), Regulation (EU) No. *305/2011 (CPR)* applies.
The products require a Declaration of Performance in accordance with *EN 845-1* – Specifications for complementary components for masonry – Part 1: Wall anchors, tie bars and supports and brackets, and the CE marking.
Where applicable, the relevant approvals and respective national regulations apply to their use.

2.4 Delivery status

The dimensions as supplied are:
Length up to 600 mm
Strip thickness from 0.5 to 2.0 mm, width up to 60 mm

2.5 Base materials/Ancillary materials

BEVER wall connectors and anchor bolts consist of approximately 70% stainless steel strip. A mixture of 1.4362 Lean Duplex stainless steel A4, 1.4401 and 1.4402 stainless steel is used. The remaining just under 30% is made of galvanised sheet steel.

The product/at least one component contains substances from the ECHA list (candidate list) of substances of very high concern (SVHC) (01.07.2025) above 0.1% by weight: no.

The product/at least one component contains other CMR substances of category 1A or 1B that are not on the Candidate List above 0.1% by weight in at least one component: no.

Biocidal products have been added to this construction product or it has been treated with biocidal products (it is therefore a treated article within the meaning of the Biocidal Products Regulation (EU No. 528/2012)): no.

2.6 Manufacture

Wall connectors and connection anchors
The wall connectors and connection anchors are manufactured entirely and exclusively from stainless steel strip or galvanised steel strip.

Depending on the product variant, the pre-punched parts are then bent into their final shape.
The raw material is purchased from steel suppliers and delivered to BEVER in coil form.
Production begins with the preparation of the manufacturing machine; in this case, the wall connectors and connection anchors are produced using a punch press.
Once the machine and tool settings have been checked and the stainless steel strip has been fed into the machine, the production process begins.
The production process is largely fully automated.
The wall connectors and connection anchors are neither machined nor cleaned after production, e.g. degreasing or similar processes.
The resulting metal offcuts and punching waste are collected in containers and stored, then collected by a scrap dealer and sent for recycling.

2.7 Environment and health during manufacturing

Throughout the entire manufacturing process, no health and safety measures beyond the standard occupational health and safety measures for commercial enterprises are required.
Compliance with environmental, health and safety measures is ensured by trained and qualified staff.
All types of waste, such as steel, wood (wooden pallets) and packaging materials, which are generated upon delivery of the raw materials or as surplus material during production, are sorted by type and recycled.

2.8 Product processing/Installation

The installation of wall connectors and connection anchors must be carried out by trained personnel.
The manufacturer's specifications, the General Building Approval or relevant standards must be complied with.
The wall connectors are simply placed into the mortar bed; no further tools are required. The connection anchors are hooked into an existing rail system. The rail system is not part of the EPD nor is it part of the BEVER product range. The wall anchors are fixed to one side of a wall. One or two drill holes are required.
The other side of the wall anchors is embedded in a mortar joint.
No additional materials are required apart from the dowels.
The only tools required are a drill bit, a drill and a hammer.
Installation is not covered by the EPD.

2.9 Packaging

The wall connectors and anchor bolts are packed in cardboard boxes.
They are shipped either directly in outer cartons or as palletised goods on Euro pallets.
PE stretch film and PE strapping bands are used to secure the load during transport.
The packaging material is easy to separate and can be sorted by type and sent to the local recycling centre.

2.10 Condition of use

The material composition of BEVER wall connectors & anchor bolts does not change over their service life.

2.11 Environment and health during use

The processing or installation of the wall connectors and connection anchors does not give rise to any health or environmental risks.
No special measures to protect the environment are required.
Based on current knowledge, risks to air and soil can be ruled out provided the products described are used as intended and in accordance with best practice.

2.12 Reference service life

The reference service life could not be determined in accordance with *ISO 15686*. According to the service lives of building components for life-cycle analyses under the German Sustainable Building Assessment System (*BBSR 2017*), the service life of steel components such as wall ties and connection anchors is at least 50 years. The wall ties and connection anchors are installed in a mortar bed . Once the mortar has set, there is no further ingress of moisture and therefore no further stress on the material.

Consequently, the products are completely isolated from the environment and protected from external influences. There is no direct weathering, and the corresponding ageing of the products over the reference service life is negligibly low.

2.13 Extraordinary effects

Fire

The products described, BEVER wall connectors and connection anchors, are manufactured from stainless steel or galvanised steel and are classified as non-combustible building materials in building material class A in accordance with *DIN 4102-1.*

Fire protection

Name	Value
Building material class	A

Water

No water-polluting ingredients are washed out.

Mechanical destruction

In the event of mechanical destruction, all substances remain in a bound state. Mechanical destruction has no relevant effects on the environment.

2.14 Re-use phase

During dismantling, the wall connectors and anchor bolts become deformed and cannot be reused. No additional sharp edges are created during dismantling that would make the process more difficult.
All steel components can be recycled as scrap and reused.

2.15 Disposal

The waste code according to the Waste Catalogue Regulation (AVV) is 17 04 05 - iron and steel.

2.16 Further information

Technical documents and further information on BEVER wall ties and connection anchors are available to view or download online at: www.bever.de/downloads.

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 kg of wall connectors & connection anchors from BEVER. The unit weights of BEVER's products range from 0.0075 kg/unit to 0.0863 kg/unit, with an average product weight of 0.0422 kg/unit. However, this plays only a minor role in the conversion of the results, as a declared unit of 1 kg has been chosen.

Declared unit and mass reference

Name	Value	Unit
Density	-	kg/m^3
Declared unit	1	kg
Conversion factor from kg to t	0,001	t

Section 2.1 provides a more detailed description of the products included in this EPD and used to calculate the averages.

3.2 System boundary

The life cycle assessment considers the system boundaries "cradle to factory gate – with options" (modules A1–A3 + C + D) and follows the modular structure set out in *EN 15804.*

The life cycle assessment takes the following modules into account:

A1: Raw material extraction and processing: This includes all inputs for the production of wall ties & connection anchors, including stainless steel strip and galvanised steel sheets, which are used as base materials or precursors by BEVER's suppliers for the production of wall ties & connection anchors.

A2: Transport to the manufacturer: Transport of the intermediate products (in this case primarily (stainless) steel sheets) to the BEVER factory.

A3: Manufacturing processes and inputs at the factory: all raw materials and intermediate products required for the production of wall connectors & connection anchors are received, stored and, as required by the respective product variant, packaged and prepared for delivery. During this process, the stainless steel strip is fed into the machine during the punching process and the item is punched using a tool. Also part of Module A3 is the disposal of the packaging.
C1: Dismantling/demolition: For the dismantling, a comparable demolition process was modelled from the ökobaudat database. Excavators, demolition grapples and sorting grapples are used. The shredding of scrap was not taken into account in this case, as the wall connectors and connection anchors are of a manageable size. Sorting by material components is an integral part of the demolition on the construction site. A collection rate of 90% is assumed. The remaining 10% are, in accordance with standard assumptions, transported to the nearest construction waste collector and modelled as a landfill process. For this 10%, neither processing costs nor material credits are allocated; the end of waste status is reached for this quantity of material at the time of landfill.

C2: Transport to waste management: For the recyclable 90% of scrap quantities, transport to the recycling centre or scrap dealer is assumed to be 60 km by default. A standard 40-tonne lorry from ecoinvent is used for the modelling.

C3: Waste management for reuse, recovery and/or for recycling: A realistic, albeit optimistic, assumption is made that 95% of the scrap content of the wall connectors & connection anchors goes for recycling. For the (stainless) steel quantities kept in the cycle, corresponding credits are allocated in Module D.

C4: Disposal: The defined steel scrap or recycling loss of 5% is modelled as a landfill process (like the collection losses from Module C1).

D: Reuse, recovery or recycling potential as net flows and credits or debits: Substitution effects arise to the same extent as the total quantity of recycled steel scrap (95% of the scrap quantities from Module C3); steel from this product system in Module D can accordingly replace an equivalent quantity of primary steel in another/hypothetical product/downstream system, thereby saving the same amount of primary steel produced.

3.3 Estimates and assumptions

Energy and resource consumption during production, as well as the quantities of purchased inputs, packaging and transport routes, were collected directly using the data collection tables from BEVER. This primary data is complete, consistent and represents a representative survey year.
The disposal of packaging is modelled in Module A3. All reusable packaging, pallets and other tertiary packaging are excluded from disposal in A3, as they are not disposed of at the end of their life cycle.
For the production of intermediate products such as sheet metal, standard data sets from the *ecoinvent3.11* database. Additional information from the manufacturer, data sheets and standard market assumptions were also used as a basis to select the most appropriate data set.
For the forming processes from steel to steel strip, for example, additional costs corresponding to the standard data sets were added.
Offcuts from the BEVER plant itself are sent to the local scrap dealer; they consist of 100% secondary material and cease to be waste upon handover to the scrap dealer; processing costs and material credits are consequently outside the system boundary and are accounted for as a cut-off. No credits are allocated in Module D . For demolition in Module C1, a standard demolition process from an ökobaudat dataset for façade clinker was used.
The sorting of the metal fraction from the scrap recycling volume was modelled as a power-based cost

based on the energy data of a magnetic separation process. In Module C1, a collection rate of 90% is assumed; the assumed 10% material losses on site are sent to landfill. Of the 90% scrap , 95% can be processed for high-quality recycling in Module C3; the remaining 5% of this material stream is modelled in C4 as a landfill process, just like the material losses in Module C1.

3.4 Cut-off criteria

All relevant data, i.e. all raw materials used in production as well as the energy and resources used in production, were extracted using a data collection sheet following a prior comprehensive survey of the company's operational data for the life cycle assessment. For the inputs and outputs considered, the actual transport distances were used or estimated using documented rules. Material and energy flows with a share of < 1% were included. This means that the sum of the neglected processes is less than 5 % of the impact categories. The costs for the provision of infrastructure (machinery, buildings, etc.) for the entire foreground system were not taken into account. The disposal of packaging is covered in Module A3, and is additionally documented as technical scenario information in accordance with the PCR in Chapter 4 of this EPD. The disposal of reusable and tertiary packaging is not included in the assessment.

3.5 Background data

Background data for modelling and missing inventories of intermediate products are based on the LCIA database *ecoinvent 3.11*. Modelling and impact assessment are carried out using the SimaPro software (*version 10.2.0.1)*.

3.6 Data quality

The life cycle assessment is based on plant-specific data collection, including all energy sources and operating resources for one year (the period under review being January to December 2024). The collected data was checked for representativeness in relation to previous years. Data sets for background data are based on the *ecoinvent 3.11* database. Missing specific data on intermediate products (such as the manufacture of steel strips) were modelled on the basis of generic data sets from *ecoinvent 3.11*, taking into account country-specific conditions. As not all relevant process steps are covered here, these were therefore remodelled using supplementary secondary data. The data quality of all emission factors used in terms of DQ Geo, Tech and Time can be classified as good for primary data and as moderate for secondary data. The most recent data sets from the ecoinvent database were always used. It should be noted that primary data for sub-components such as steel strips could not be obtained from suppliers. The basis of the modelling in A1 is founded on secondary data, the evaluation of data sheets, general market-standard processes and assumptions made by the life cycle assessor regarding production processes. Accordingly, the assessment of the technical data quality for the upstream processes is mostly rated as medium. The extent to which this has a concrete impact on the overall result cannot be determined quantitatively; the data sets were compiled with the utmost care and in line with reality.

3.7 Period under review

The quantities of raw materials and energy used, as well as the amounts of waste and all other data collected, relate to the year 2024 (January to December).

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: Germany

3.9 Allocation

All energy consumption and material flows for the product could be allocated on the basis of measured production data or on a mass basis. A net flow calculation was carried out for the proportion of secondary materials used in production (stainless steel scrap). In Module D, the proper disposal of steel scrap results in substitution effects for high-quality material recycling. The emission factor for the electricity mix in A1-A3 is 0.821 kg CO2e/kWh.

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 *ecoinvent 3.11* background database was used, along with the EF3.1 Method (adapted) V1.03 analysis method.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The product contains less than 5% biogenic carbon in relation to the total mass of the product, which is why this information is not included in this EPD.

The use of packaging material has been accounted for in relation to the declared product; the disposal of the packaging material is recorded in Module A3. For reusable packaging such as pallets, crown stands and squared timber, emissions have not been reported in Module A3.

In line with the packaging quantities specified in A3, the following quantities of biogenic carbon are sequestered. Cardboard packaging (0.031 kg/DU): 0.058 kg CO2/kg Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

The reference service life could not be determined in accordance with *ISO 15686*. The service life is taken from Table *BBSR 2017*, Service lives of building components for life cycle assessments according to the Sustainable Building Assessment System

(*BNB*).

Reference service life

Name	Value	Unit
Reference service life (according to BBSR)	50	a

End of life (C1 - C4)

Name	Value	Unit
Separately collected stainless steel strip	0.707	kg
Separately collected steel strapping	0.293	kg
For recycling stainless steel strip (95%)	0.672	kg
For recycling Steel strapping (95%)	0.278	kg
Construction waste stainless steel strip (5% recycling loss)	0.035	kg
Construction waste Steel strip (5% recycling loss)	0.015	kg

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

Name	Value	Unit
Net stainless steel scrap in EoL	0.523	kg
Net steel scrap in EoL	0.206	kg

This scenario assumes a collection rate of 90% and a recycling rate of 95%.

5. LCA: Results

The following table summarizes the results of the life cycle assessment. The results of the impact assessment do not allow any conclusions to be drawn about endpoints of the impact categories, exceedances of threshold values, safety margins, or risks. Long-term emissions >100 years are not considered in the impact assessment. The impact assessment is based on *EN 15804*, in accordance with *SimaPro* 10.2.0.1.

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	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg wall connectors & connection anchors from BEVER

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	4.25E+00	3.11E-01	5.5E-03	1.02E-03	4.52E-04	-1.85E+00
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	4.21E+00	3.11E-01	5.5E-03	1.02E-03	4.51E-04	-1.85E+00
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	3.61E-02	3.11E-05	1.18E-06	1.2E-07	9.03E-08	-9.48E-04
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	2.97E-03	3.18E-05	2.05E-06	9.97E-08	1.57E-07	-8.23E-04
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	4.38E-08	4.59E-09	1.25E-10	1.29E-11	9.92E-12	-9.85E-09
Acidification potential of land and water (AP)	mol H^+ eq	1.79E-02	8.54E-04	1.34E-05	2.65E-06	2.08E-06	-7.54E-03
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	2.29E-03	9.99E-06	4.02E-07	5.34E-07	3.19E-08	-1.26E-03
Eutrophication potential aquatic marine (EP-marine)	kg N eq	4.22E-03	3.3E-04	3.51E-06	6.89E-07	8.14E-07	-1.67E-03
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	4.08E-02	3.62E-03	3.8E-05	6.74E-06	8.88E-06	-1.79E-02
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	1.37E-02	1.46E-03	2.23E-05	1.89E-06	3.12E-06	-5.99E-03
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	3.86E-05	1.13E-07	1.6E-08	8.09E-10	1.48E-09	-1.68E-05
Abiotic depletion potential for fossil resources (ADPF)	MJ	5.15E+01	4.02E+00	8.34E-02	1.22E-02	6.51E-03	-1.93E+01
Water use (WDP)	m^3 world eq deprived	8.75E-01	8.62E-03	3.79E-04	1.4E-05	2.7E-05	-4.18E-01

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg wall connectors & connection anchors from BEVER

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	7.47E+00	2.54E-02	1.29E-03	9.6E-05	1.08E-04	-2.16E+00
Renewable primary energy resources as material utilization (PERM)	MJ	0	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	7.47E+00	2.54E-02	1.29E-03	9.6E-05	1.08E-04	-2.16E+00
Non renewable primary energy as energy carrier (PENRE)	MJ	5.47E+01	4.27E+00	8.87E-02	1.31E-02	6.93E-03	-2.05E+01
Non renewable primary energy as material utilization (PENRM)	MJ	0	0	0	0	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	5.47E+01	4.27E+00	8.87E-02	1.31E-02	6.93E-03	-2.05E+01
Use of secondary material (SM)	kg	2.52E-01	0	0	0	0	7.29E-01
Use of renewable secondary fuels (RSF)	MJ	0	0	0	0	0	0
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	0
Use of net fresh water (FW)	m^3	2.91E-02	2.85E-04	1.16E-05	1.9E-06	8.59E-07	-1.22E-02

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg wall connectors & connection anchors from BEVER

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	4.18E-04	2.8E-05	5.55E-07	6.41E-08	4.4E-08	-1.68E-04
Non hazardous waste disposed (NHWD)	kg	4.42E-01	3.52E-03	7.19E-03	2.2E-05	4.05E-04	-1.33E-01
Radioactive waste disposed (RWD)	kg	1E-04	4.23E-07	2.29E-08	8.87E-09	1.99E-09	-1.65E-05
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	0	0	0	8.55E+02	0	0
Materials for energy recovery (MER)	kg	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	0	0	0	0	0	0
Exported thermal energy (EET)	MJ	0	0	0	0	0	0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 kg wall connectors & connection anchors from BEVER

Parameter	Unit	A1-A3	C1	C2	C3	C4	D

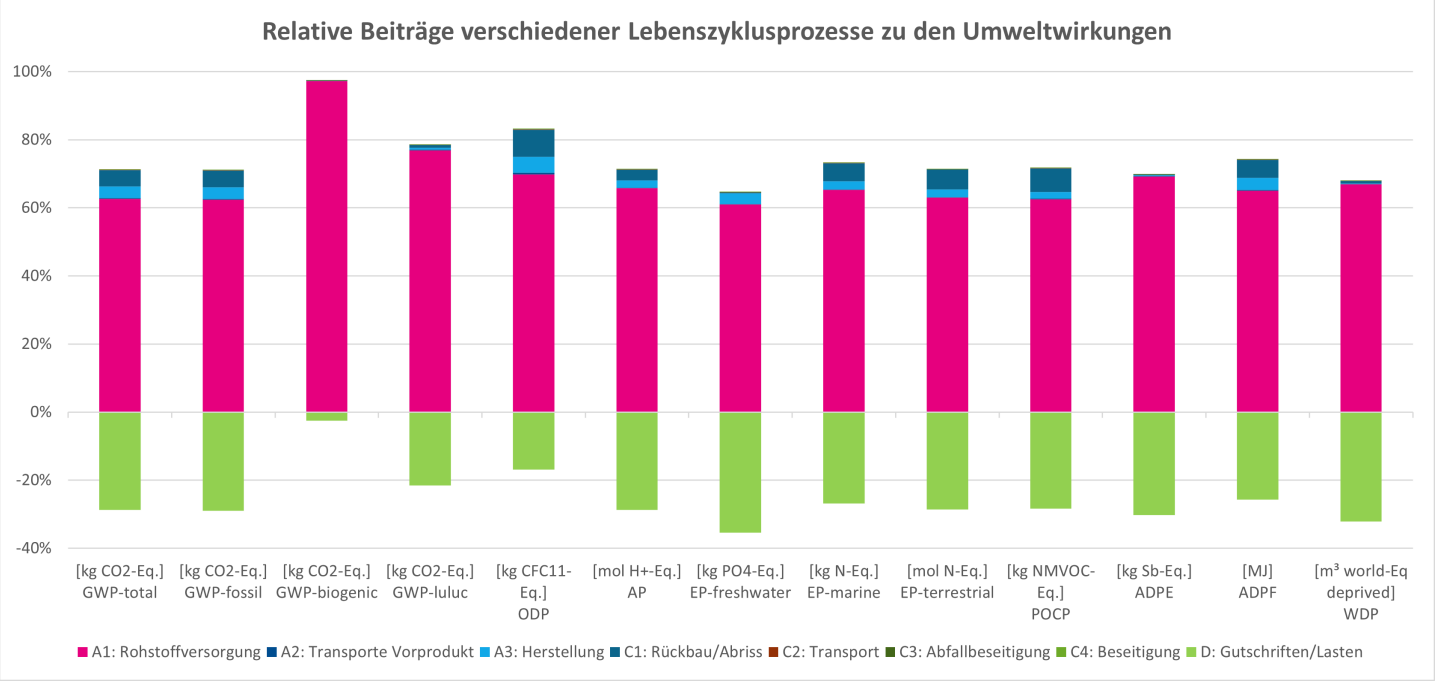
Incidence of disease due to PM emissions (PM)	Disease incidence	2.77E-07	2.07E-08	5.45E-10	9.23E-12	4.45E-11	-1.49E-07
Human exposure efficiency relative to U235 (IR)	kBq U235 eq	3.91E-01	1.72E-03	9.33E-05	3.01E-05	8.05E-06	-6.46E-02
Comparative toxic unit for ecosystems (ETP-fw)	CTUe	4.83E+01	4.2E-01	1.91E-02	2.88E-03	1.68E-03	-2.31E+01
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	4.2E-09	1.85E-10	9.08E-13	8.07E-14	1.15E-13	-2.44E-09
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	4.08E-08	7.12E-10	5.34E-11	5.1E-12	4.53E-12	-1.61E-08
Soil quality index (SQP)	SQP	2.72E+01	2.76E-01	8.38E-02	1.18E-03	4.86E-03	-6.13E+00

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.

6. LCA: Interpretation

The following figure shows the relative contributions of different life cycle phases in the form of a dominance analysis for each impact category.



A large proportion of the emissions within the individual impact categories arise during the manufacturing phase (A1-A3). The main drivers for this are, in particular, the production ofraw materials in the intermediate products. The manufacturing emissions are very low in the figure. Relative contributions of variouslife cycle processes to the environmental impacts,since the upstream chain of stainless steel production typically has a particularly significant impact for (stainless) steel processing companies.In terms of total GWP, emissions from the manufacturing phase of the intermediate products contribute almost 95% to the total emissions of the entire value chain.Across all impact categories, this figure is at least 93%.The emission profile is correspondingly clear in the LCA of thewall connectors.Since the individual components always consist of steel or stainless steel and the forming processes have similar emission profiles, the overall result depends more on the quantity of material used in the individualproduct types than on the specific emissions of each individual EF. The differences contribute less to aadditional effect than the pure quantities of materials themselves. Incompared to raw material supply (A1), the contributions to theenvironmental impacts of GWP from the transport ofintermediate products (A2) within the manufacturing phase are very small, and their significance with regard to the impact on GWP, like the production phase itself, is negligible.Within the cradle-to-gate system boundary (A1-A3), theprimary energy demand from non-renewable energy sources is 88%, and that from renewable energy sources is accordingly 12%. The PERT and PENRT values for module A1 show the same ratio. The largest contributors here are also (stainless) steel production in the upstream chains.Within the manufacturing phase (A1-A3), the highestcontribution to non-renewable primary energy demand (PENRT) results from the raw materials (A1) (almost 95%). The energy required for manufacturing contributes approximately 5% to the total PENRT, a higher proportion than transport (< 1%).

When considering the total renewable primary energy demand (PERT), the same picture emerges as with PENRT. Here, however, the energy demand from raw materials still has a dominant effect (> 99%).
For wall connectors and anchors, BEVER reports a range of 0.0075 to 0.0863 kg/piece due to the varying stress and size of the products, with an average weight of 0.04215 kg/piece.The

total inputs and outputs for the year 2024 were processed and calculated per kg of net product. The range of fluctuations illustrates that the results can vary by a factor of 0.18 to 2.05 (e.g., GWP) if material input increases proportionally. According to BEVER, the data for 2024 is representative.

7. Requisite evidence

No external evidence is required for this environmental product declaration in accordance with PCR Part B.

8. References

Standards

EN 845
DIN EN 845-1:2016-12: Specifications for supplementary components for masonry - Part 1: Wall anchors, tension ties, supports, and brackets.

DIN 4102
DIN 4102-1:1998-05: Fire behavior of building materials and components - Part 1: Building materials; terms, requirements, and tests.

ISO 9001
DIN EN ISO 9001:2015: Quality management systems - Requirements.

EN 10088
DIN EN 10088-3:2024-04: Stainless steels - Part 3: Technical delivery conditions for semi-finished products, bars, wire rod, drawn wire, profiles and bright steel products made of corrosion-resistant steels for general use.

EN 10152
DIN EN 10152:2017-06: Electrolytically galvanized cold-rolled flat products made of steel for cold forming – Technical delivery conditions.

EN 10346
DIN EN 10346:2015-10: Continuously hot-dip coated flat products made of steel for cold forming – Technical delivery conditions.

ISO 14001
DIN EN ISO 14001:2015: Environmental management systems - Requirements with guidance for use.

ISO 14025
DIN EN ISO 14025: 2011-10: Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

ISO 14040
DIN EN ISO 14040:2021-02: Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006 + Amd1:2020).

ISO 14044
DIN EN ISO 14044:2021-02: Environmental management - Life cycle assessment - Requirements and guidance (ISO 14044:2006 + Amd1:2017
+ Amd 2:2020).

EN 15804
DIN EN 15804:2022-03: Sustainability of construction works - Environmental product declarations - Basic rules for the product category construction products.

ISO 50001
DIN EN ISO 50001:2011: Energy management systems - Requirements with guidance for use.

Further reading

AVV
Ordinance on the European Waste Catalogue (Waste Catalogue Ordinance - AVV), construction and demolition waste (including excavation from contaminated sites).

BBSR 2017
Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR): Service life of building components. Service lives of building components for life cycle analyses according to the Sustainable Building Assessment System (BNB), in: Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (ed.), 2017.

BEVER
BEVER Gesellschaft für Befestigungsteile Verbindungselemente GmbH: https://www.bever.de/.

CPR
Regulation (EU) No. 305/2011: Regulation of the European Parliament and of the Council of March 9, 2011, laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC (EU Construction Products Regulation), in: Official Journal of the European Union L 88/5, April 2011.

ECHA list
European Chemical Agency (ECHA): CMR substances from Annex VI of the CLP Regulation that have been registered in accordance with REACH and/or notified in accordance with CLP.

Ecoinvent 3.11
ecoinvent V 3.11 (2025): Eco-inventory database version 3.10 of the Swiss Center for Eco-inventories, Dübendorf.www.ecoinvent.ch (German).

IBU 2022
Institut Bauen und Umwelt e.V. (publisher): The creation of environmental product declarations (EPD). General EPD program guide of the Institute for Construction and Environment (IBU), version 2.1, 2022.

Candidate list
European Chemical Agency (ECHA): Candidate List of substances of very high concern for Authorization, in: https://echa.europa.eu/candidate-list-table, 2020.

PCR Part A
Institut Bauen und Umwelt e.V. (publisher): Product category rules for building-related products and services. Part A: Calculation rules for the life cycle assessment and requirements for the project report, version 1.4, 2022.

PCR Part B
Institut Bauen und Umwelt e.V. (ed.): PCR guidance texts for building-related products and services. Part B: Requirements for EPDs for structural steels, version v6 dated August 1, 2024.

SimaPro
Prè Sustainability: SimaPro Version 10.2.0.1, 2025.

Publisher

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Programme holder

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Author of the Life Cycle Assessment

myclimate Deutschland gGmbH
Kurrerstr. 40/3
72762 Reutlingen
Germany

+49 7121 9223 50
kontakt@myclimate.de
www.myclimate.de

Owner of the Declaration

BEVER Gesellschaft für Befestigungsteile
Verbindungselemente mbH
Auf dem Niedern Bruch 12
57399 Kirchhundem- Würdinghausen
Germany

+49 (0) 2723 9760
Mailadresse@bever.de
www.bever.de