

# Environmental Product Declaration



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

## Galvanized timber connectors (multiple products)

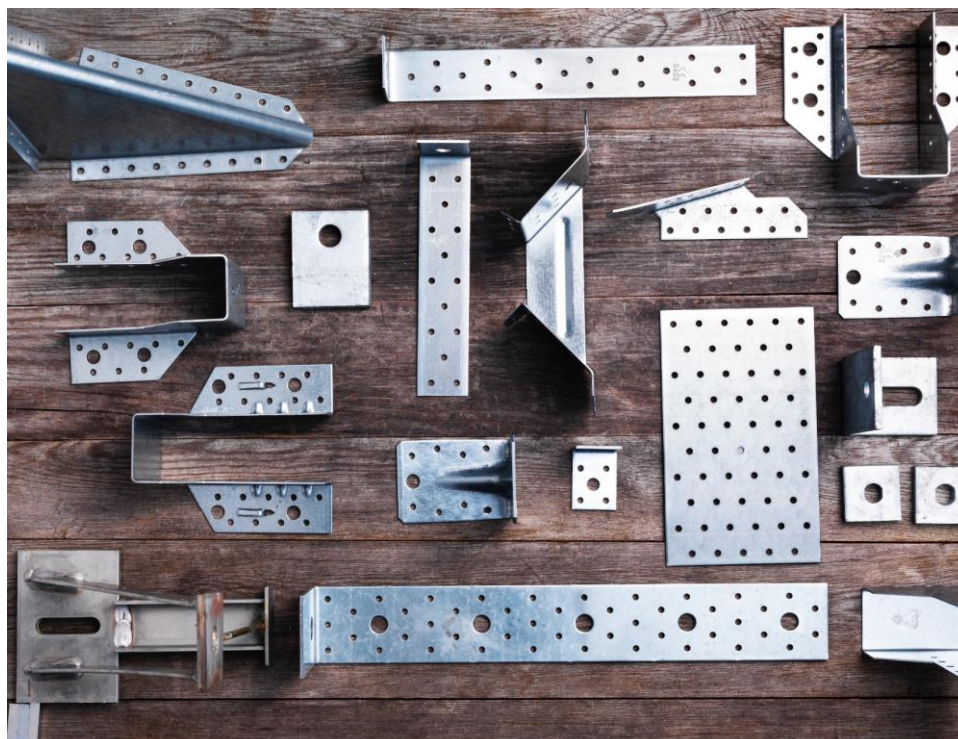
from

**Joma AB**



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
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*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com)*



## General information

### Programme information

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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<b>Accountabilities for PCR, LCA and independent, third-party verification</b>
<b>Product Category Rules (PCR)</b>
CEN standard EN 15804:2012+A2:2019/AC:2021 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): <i>PCR 2019:14 Construction products. Version 1.2.5, date 2022-11-01.</i>
PCR review was conducted by: <i>The Technical Committee of the International EPD® System. Chair: Claudia A. Peña. Contact via <a href="mailto:info@environdec.com">info@environdec.com</a></i>
<b>Life Cycle Assessment (LCA)</b>
LCA accountability: <i>Zackarias Heydorn, IVL Swedish Environmental Research Institute</i>
<b>Third-party verification</b>
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:  <input checked="" type="checkbox"/> EPD verification by individual verifier  Third-party verifier: David Althoff Palm, Dalemarken AB  Approved by: The International EPD® System  Procedure for follow-up of data during EPD validity involves third party verifier:  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison.

## Company information

### Owner of the EPD:

Joma AB, Målskog, 335 91 Gnosjö, Sweden

### Contact:

Gustaf Josefsson (gustaf@joma.se)

Jennie Johansson (jennie@joma.se)

### Description of the organisation:

Joma develops, manufactures and market products for the building industry, such as timber connectors (joist hangers, angle brackets, jointing plates, steel straps, column shoes) and cavity wall products (wall ties, masonry reinforcement, sliding layers). Also, we straighten and cut wire according to our customers' specific wishes. All of Joma's development and manufacturing is carried out in the 17,000 square meters large, modern and, to a great extent, completely automated factory in the centre of the Gnosjö region.

Joma AB employs around 50 people and are a part of the EBIM group.

### Product-related or management system-related certifications:

CE-approved according to harmonized standard and ETA.

### Location of production site:

Sweden

## Product information

### Product name:

Galvanized timber connectors (multiple products)

### Product identification:

The product category investigated includes multiple products, joist hangers, angle brackets, jointing plates and bars and roof connectors, all which comes in a variety of variants and sizes. The results within this EPD reflects the worst-case result of all investigated products and variants, thus this EPD is valid for multiple products.

### Product description:

The timber connectors are used for creating connections between wood to wood, or wood to concrete in construction projects.

### UN CPC code:

41266

### Geographical scope:

Sweden

## LCA information

### Declared unit:

1 kg of galvanized timber connectors

### Time representativeness:

The data used to model product manufacturing corresponds to year 2022. The data from generic databases are from 2018 - 2021. No data used is older than 10 years. The data used for steel production is supplier specific data.

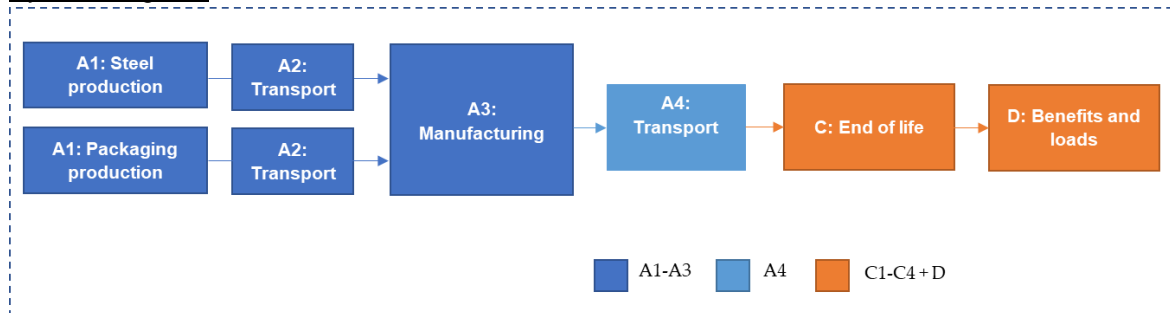
### Database(s) and LCA software used:

Databases used are the Sphera LCA databases (content version 2023.1). The LCA software used is Sphera LCA for Experts (version 10.7).

### Description of system boundaries:

Cradle to gate with options, modules C1-C4, module D and with optional module A4.

### System diagram:



Steel and packaging materials are transported to a manufacturing plant where the galvanized timber connectors are manufactured. In this plant the steel is bent, cut and punched (all dry operations) to different shapes and sizes depending on which product that are manufactured. The connectors are then distributed to the final customers. After use the product is transported to waste processing, and the steel is recycled.

The transportation of the final product (A4) is modelled with truck transport, 150 km, diesel fuel and a load factor of 38%.

The description of module C is found in the table below.

Module	Description	Modelling information
C1 – Deconstruction, Demolition	Energy used for deconstruction	Diesel consumption assumed of 0.004 MJ/kg (Erlandsson et.al, 2015).
C2 – Transportation	Transport of waste to waste processing and disposal	Transport of 150 km by truck (assumption)
C3 – Waste processing	Processing of the steel construction waste before recycling.	Modelled with the dataset for construction waste treatment plant
C4 – Disposal	Disposal (landfill) of waste not sent for waste processing	Modelled with the dataset construction waste dumping

In module D the benefits from recycling finished steel products instead of producing new steel products from virgin material is assessed. This does not include the steel recycled in the production. The net flows of recovered material is 82% (based on supplier specific data). The dataset value of scrap (worldsteel) is used to assess the benefits of recycling.

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

	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	
Module	A1	A2	A3	A4	A5 <sup>1</sup>	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	SE	SE	SE	SE	-	-	-	-	-	-	-	-	SE	SE	SE	SE	SE
Specific data used	96,3%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	5%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X: Module declared, ND: Module not declared, SE: Sweden

The results presented reflect the worst-case result of all investigated products and variants. The variation between the best and worst case were more than 10% for some indicators, hence the worst-case results are presented here, according to requirements in the PCR.

Allocation:

The manufacturing data were divided by the total weight of articles produced. In the manufacturing of the products steel scrap is generated. The allocation between the product and the steel scrap was conducted with co-product allocation with the conservative value of 0 for scrap. This mean that all environmental impacts are allocated to the main products.

Data quality:

Site-specific manufacturing data has been retrieved from the manufacturer. The upstream and downstream processes have been modelled based on generic data from databases, except from the steel production which is modeled based on an EPD (S-P-01921) from the steel provider. The collected data was reviewed according to EN 15804 and is deemed as of good quality.

Cut-off criteria:

The maximum 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, e.g. per module A1-A3, A4-A5, C1-C4 and module D. No cut-offs exceeding this limit have been made.

## Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Hot-dipped galvanized steel	1,0	2,6 <sup>(1)</sup>	0% resp. 0 kg C/kg
TOTAL	1,0	2,6 <sup>(1)</sup>	0% resp. 0 kg C/kg
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Corrugated fiberboard	0,111	11,1%	0,43 kg C/kg <sup>(2)</sup>
TOTAL	0.111	11,1%	0,43 kg C/kg <sup>(2)</sup>

(1) Based on input from supplier specific data.

(2) Based on information from the generic dataset used to represent corrugated fiberboard. 0.43 kg C per kg corrugated fiberboard.

No substances that appear in the REACH candidate list of SVHC (Candidate List of Substances of Very High Concern) are present or used in the product.

## Environmental Information

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

Results per 1 kg galvanized timber connectors								
Indicator	Unit	Tot. A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	2.82E+00	1.86E-02	3.49E-03	1.04E-02	2.27E-03	2.27E-03	-1.43E+00
GWP-fossil	kg CO2 eq	2.81E+00	1.83E-02	3.46E-03	1.03E-02	2.24E-03	2.25E-03	-1.43E+00
GWP-biogenic	kg CO2 eq	7.10E-04	6.11E-05	1.06E-05	3.43E-05	1.01E-05	8.46E-06	6.93E-04
GWP-luluc	kg CO2 eq	1.31E-03	1.99E-04	2.76E-05	1.12E-04	1.69E-05	7.00E-06	-2.94E-05
ODP	kg CFC-11 eq	2.06E-12	3.04E-18	4.30E-19	1.71E-18	3.75E-15	5.73E-15	-3.12E-15
AP	mole H+ eq	7.69E-03	2.90E-05	3.38E-05	1.37E-05	1.17E-05	1.60E-05	-3.06E-03
EP-freshwater	kg PO43- eq	1.66E-05	4.20E-07	3.07E-08	2.36E-07	2.34E-08	1.39E-08	-7.94E-07
EP-freshwater	kg P eq	5.39E-06	1.37E-07	9.99E-09	7.67E-08	7.63E-09	4.54E-09	-2.59E-07
EP-marine	kg N eq	1.99E-03	9.99E-06	1.64E-05	4.31E-06	5.37E-06	4.13E-06	-5.39E-04
EP-terrestrial	mole N eq	2.13E-02	1.27E-04	1.81E-04	5.68E-05	5.93E-05	4.54E-05	-4.73E-03
POCP	kg NMVOC eq	5.80E-03	2.27E-05	4.81E-05	1.03E-05	1.46E-05	1.25E-05	-2.19E-03
ADP-minerals & metals*	kg Sb eq	1.81E-04	1.79E-09	2.56E-10	1.01E-09	2.40E-09	1.04E-10	-3.55E-06
ADP-fossil*	MJ	3.38E+01	2.39E-01	4.48E-02	1.34E-01	4.41E-02	3.00E-02	-1.31E+01
WDP*	m3	7.31E-02	2.63E-04	2.92E-05	1.48E-04	4.36E-04	2.47E-04	-2.65E-01
Abbreviations		GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption						

\* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.



## Potential environmental impact – additional mandatory and voluntary indicators

Results per 1 kg galvanized timber connectors								
Indicator	Unit	Tot. A1-A3	A4	C1	C2	C3	C4	D
GWP-GHG <sup>2</sup>	kg CO <sub>2</sub> eq.	2.81E+00	1.81E-02	3.40E-03	1.01E-02	2.20E-03	2.22E-03	-1.37E+00

## Use of resources

Results per 1 kg galvanized timber connectors								
Indicator	Unit	Tot. A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	5.03E+00	2.51E-02	2.50E-03	1.41E-02	4.10E-03	4.89E-03	8.25E-01
PERM	MJ	1.76E+00	0.00E+00	0.00E+00	0.00E+00	-1.76E+00	0.00E+00	0.00E+00
PERT	MJ	6.79E+00	2.51E-02	2.50E-03	1.41E-02	4.10E-03	4.89E-03	8.25E-01
PENRE	MJ	3.38E+01	2.39E-01	4.49E-02	1.34E-01	4.42E-02	3.00E-02	-1.31E+01
PENRM	MJ.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	3.38E+01	2.39E-01	4.49E-02	1.34E-01	4.42E-02	3.00E-02	-1.31E+01
SM	kg	2.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	8.77E-23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	1.03E-21	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m <sup>3</sup>	2.24E-03	3.22E-05	2.86E-06	1.81E-05	1.26E-05	7.58E-06	-5.98E-03
	Abbreviations	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water						

<sup>2</sup> The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.



## Waste production and output flows

### Waste production

Results per 1 kg galvanized timber connectors								
Indicator	Unit	Tot. A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste disposed	kg	6.54E-02	1.24E-11	2.26E-12	6.97E-12	0.00E+00	6.53E-13	-1.01E-10
Non-hazardous waste disposed	kg	8.33E-02	5.48E-05	6.66E-06	3.08E-05	1.16E-05	1.50E-01	1.99E-01
Radioactive waste disposed	kg	8.41E-04	3.59E-07	5.43E-08	2.02E-07	5.93E-07	3.42E-07	1.63E-06

### Output flows

Results per 1 kg galvanized timber connectors								
Indicator	Unit	Tot. A1-A3	A4	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	1.00E-01	0.00E+00	0.00E+00	0.00E+00	8.50E-01	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## References

ISO (2000): ISO 14020:2000, Environmental labels and declarations – General principles

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