

# Environmental Product Declaration



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

## Steel structures from Arcon Works Oy



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
Programme operator:	EPD International AB
EPD registration number:	S-P-0XXXX
Publication date:	202X-XX-YY
Valid until:	2026-01-05

*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
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
<b>E-mail:</b>	<a href="mailto:info@environdec.com">info@environdec.com</a>

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR): PCR 2019:14 Construction products. Version 1.0. 2019-12-20.  
UN CPC code: 412.

PCR review was conducted by: The Technical Committee of the International EPD® System.  
Chair: Claudia A. Peña.  
Contact via [info@environdec.com](mailto:info@environdec.com)

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

EPD process certification  EPD verification

Third party verifier: Hannu Karppi, Ramboll Finland Oy



*In case of recognised individual verifiers:*  
Approved by: The International EPD® System

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

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

## Company information

Owner of the EPD:

Arcon Works Oy

Contact:

Tapani Palokangas  
Managing Director  
tapani.palokangas@arcon.fi  
+358 400 716 392

Description of the organisation:

Arcon Works Oy produces welded steel structures.

Product-related or management system-related certifications:

The production is according to EN 1090-2: Technical requirements for the execution of steel structures.

Name and location of production site:

Seinäjoentie 11,  
61100 Peräseinäjoki,  
Finland

## Product information

Product name:

Steel structures

Product identification:

WQ Beams; HSQ beams; Welded columns and trusses; Welded steel structures

Product description:

Welded steel structures are used in the construction industry as structural or non-structural components. These products are mainly used in building and industrial sectors.

UN CPC code: 412 – Products of iron or steel

## LCA information

Functional unit / declared unit: Declared unit 1 ton of product

Reference service life: N/A

Time representativeness: The data is collected from 07/2019-06/2020. The database data are from 2019.

Database(s) and LCA software used: SimaPro (release 9.1.0.11) and database Ecoinvent 3.6.

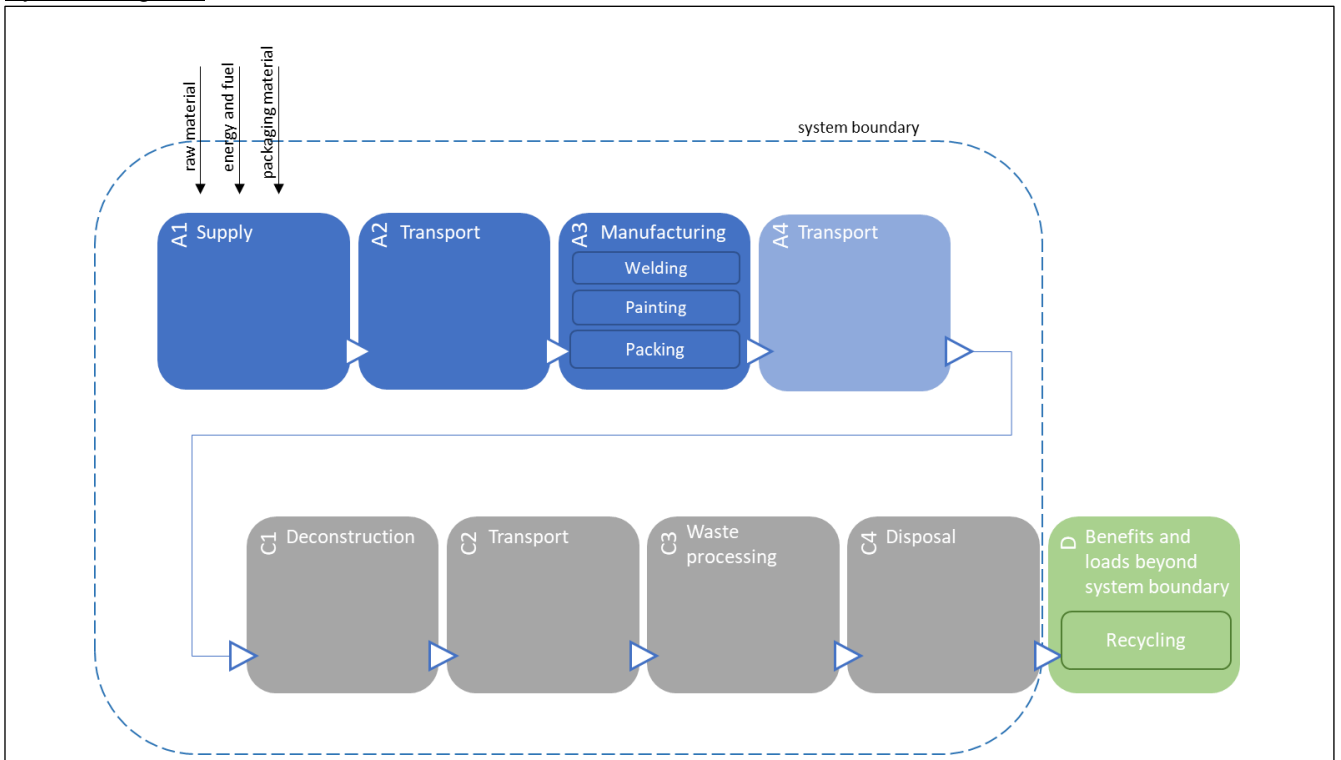
Description of system boundaries: Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and additional modules). The additional module is A4.

Excluded lifecycle stages: Modules A5, B1-B5 and B6-B7 are not assessed. In B1-B5, only minimal maintenance is required. The excluded modules are very dependent on particular scenarios for a specific building or construction work.

Results: The results are a weighted average based on production shares of the products.

Numbers: Numbers are expressed using the French style (comma as the decimal separator).

System diagram:



More information:

LCA practitioner: Ecobio Oy, info@ecobio.fi

Explanatory material can be obtained from the EPD owner and/or LCA practitioner.

Cut-off rule: 1% cut-off rule was applied for input flows in the inventory. The material used is as up-to-date as possible and at most five years old for producer specific data and at most ten years old for generic data.

Electricity source: The electricity is market priced electricity. The emission factor used for the electricity is 327 g CO<sub>2</sub>-eq./kWh. The emission factor includes the total CO<sub>2</sub> eq. emissions from electricity production and building the power plants.

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	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	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x		
Geography	EU27	EU27	EU27	EU27	-	-	-	-	-	-	-	-	EU27	EU27	EU27	EU27	EU27		
Specific data	>90%					-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation – products	<10%					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	not relevant					-	-	-	-	-	-	-	-	-	-	-	-	-	-

## Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Steel	997	99,7 %	0 %
Pain	3	0,3 %	0 %
TOTAL	1000	100 %	0 %
Packaging materials	Weight, kg	Weight-% (versus the product)	
Wood	14	1,4 %	
TOTAL	14	1,4 %	

The steel structures do not contain substances which exceed the limits for registration with the European Chemicals Agency regarding the “Candidate List of Substances of Very High Concern for Authorisation”.

### **Packaging**

Distribution packaging: The products are packed with wood.

### **Manufacturing**

The products manufacturing processes consist of the following phases: welding preparation, welding (automatic and manual), fitting, surface treatment (painting), marking, packing.

## Environmental Information

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

Results per declared unit											
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	1,86E+03	2,08E-01	5,13E+01	1,91E+03	1,18E+02	5,27E-01	8,26E+00	2,19E+01	5,17E-01	-1,08E+03
GWP-biogenic	kg CO <sub>2</sub> eq.	3,58E+01	1,95E-03	1,11E+01	4,69E+01	6,89E-01	1,42E-03	5,39E-02	1,37E+00	4,22E-03	-6,68E+00
GWP-luluc	kg CO <sub>2</sub> eq.	5,69E+00	6,75E-05	3,53E-01	6,04E+00	4,76E-02	5,95E-05	2,96E-03	2,52E-02	1,56E-04	-6,22E-01
GWP-total	kg CO <sub>2</sub> eq.	1,90E+03	2,10E-01	6,27E+01	1,97E+03	1,18E+02	5,29E-01	8,32E+00	2,33E+01	5,21E-01	-1,09E+03
ODP	kg CFC 11 eq.	1,14E-04	2,81E-07	7,72E-06	1,22E-04	2,11E-05	8,90E-08	1,51E-06	2,75E-06	1,72E-07	-4,11E-05
AP	mol H <sup>+</sup> eq.	1,00E+01	2,58E-03	2,34E-01	1,02E+01	9,64E-01	5,44E-03	3,41E-02	2,69E-01	5,00E-03	-5,74E+00
EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq.	1,28E+00	2,00E-05	2,35E-02	1,31E+00	8,10E-03	3,00E-05	6,15E-04	1,89E-02	5,45E-05	-7,92E-01
EP-marine	kg N eq.	2,22E+00	3,21E-04	5,07E-02	2,27E+00	2,38E-01	2,38E-03	1,02E-02	6,10E-02	1,73E-03	-1,29E+00
EP-terrestrial	mol N eq.	2,20E+01	3,53E-03	5,26E-01	2,25E+01	2,63E+00	2,61E-02	1,12E-01	6,89E-01	1,90E-02	-1,26E+01
POCP	kg NMVOC eq.	8,16E+00	1,44E-03	1,69E-01	8,33E+00	7,43E-01	7,11E-03	3,34E-02	1,85E-01	5,37E-03	-4,97E+00
ADP-minerals&metals*	kg Sb eq.	3,00E-02	1,20E-06	4,97E-04	3,05E-02	2,84E-03	9,22E-07	2,26E-04	1,23E-03	4,82E-06	-1,96E-02
ADP-fossil*	MJ	2,03E+04	2,18E+01	5,36E+02	2,09E+04	1,71E+03	7,22E+00	1,23E+02	2,65E+02	1,46E+01	-1,05E+04
WDP	m <sup>3</sup>	8,49E+00	-8,69E-05	1,10E-01	8,60E+00	-2,29E-01	-5,44E-05	-1,89E-02	-1,29E+00	1,99E-03	-7,51E+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										

\* 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 declared unit											
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	1,87E+03	2,08E-01	5,17E+01	1,92E+03	1,18E+02	5,27E-01	8,26E+00	2,19E+01	5,17E-01	-1,08E+03

## Use of resources

Results per declared unit											
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	1,95E+03	5,77E-02	8,03E+02	2,76E+03	2,29E+01	5,83E-02	1,77E+00	4,83E+01	1,19E-01	-7,59E+02
PERM	MJ	0	0	2,20E-01	2,20E-01	0	0	0	0	0	0
PERT	MJ	1,95E+03	5,77E-02	8,03E+02	2,76E+03	2,29E+01	5,83E-02	1,77E+00	4,83E+01	1,19E-01	-7,59E+02
PENRE	MJ	2,91E+04	2,15E+01	1,26E+03	3,04E+04	1,76E+03	7,34E+00	1,27E+02	3,43E+02	1,48E+01	-1,41E+04
PENRM	MJ.	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	2,91E+04	2,15E+01	1,26E+03	3,04E+04	1,76E+03	7,34E+00	1,27E+02	3,43E+02	1,48E+01	-1,41E+04
SM	kg	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0
FW	m <sup>3</sup>	1,94E+01	1,99E-04	1,01E+00	2,04E+01	1,71E-01	4,51E-04	1,32E-02	1,46E-01	1,57E-02	-2,41E+00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water										

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



## Waste production and output flows

### Waste production

Results per declared unit											
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,04E-01	5,88E-05	1,46E-03	1,05E-01	4,14E-03	2,01E-05	3,29E-04	9,29E-04	2,20E-05	-7,78E-02
Non-hazardous waste disposed	kg	7,64E+02	1,07E-02	2,13E+01	7,86E+02	7,28E+01	1,33E-02	6,01E+00	9,00E+00	1,00E+02	-4,73E+02
Radioactive waste disposed	kg	4,96E-02	1,58E-04	9,85E-03	5,97E-02	1,19E-02	4,96E-05	8,57E-04	1,82E-03	9,67E-05	-3,54E-04

### Output flows

Results per declared unit											
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	3	3	0	0	0	900	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0

### Information on biogenic carbon content

Results per declared unit		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	7

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

## Additional information

### Transportation to customer (A4)

The products are transported to the construction site by road and by sea. The transport distances were estimated based on data from 07/2019 to 06/2020 taking into account the country-specific transport scenarios.

Parameter	Unit
Vehicle type	Lorry, 16-32 metric ton*
Load capacity	37 % (ecoinvent 3.6)
Distance	200-900 km
Bulk density	1000 kg/m <sup>3</sup>

\*31% of the products are transported with EURO5 lorry and 69% with EURO6 lorry.

Parameter	Unit
Vehicle type	Ferry
Load capacity	N/A (ecoinvent 3.6)
Distance	266 km
Bulk density	1000 kg/m <sup>3</sup>

### End-of-life (C)

The products are collected from their point of installation after their expected service life. They are transported to treatment or to landfill in the end-of-life phase.

Parameter	Unit
Collection process	collected separately
Transportation	50 km road
Recovery system	90 % recycled
Disposal	10 % to landfill

## References

General Programme Instructions of the International EPD® System. Version 3.01.  
 PCR 2019:14 Construction products. Version 1.0.  
 Ecobio Oy. 2020. LCA Report – Arcon Works Oy’s Steel Structures.

