



Owner: No.: Issued: Valid to: riplan International D-23204-EN 6-03-2024 6-03-2029

3rd PARTY VERIFIED



VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804







Valid to:

26-03-2029

Owner of declaration

Triplan International A/S Industriskellet 12, DK-2635 Ishøj VAT No.: 16664081

Programme

EPD Danmark www.epddanmark.dk

□ Industry EPD ☑ Product EPD

Declared product(s)

Steel profiles and components for use in the building construction industry.

Number of declared datasets/product variations: 1

Production site

Triplan International A/S Industriskellet 12 DK-2635 Ishøj

Declared/ functional unit

1 ton steel building profiles

Use of Guarantees of Origin

 \Box No certificates used \boxtimes Electricity covered by GoO

 \square Biogas covered by GoO

Year of production site data (A3) 2021/2022

EPD version

Version 1



Kepddanmark

EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

This EPD is developed in accordance with the European

Validity

Issued:

26-03-2024

Basis of calculation

Comparability

standard EN 15804+A2.

This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use

The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type

□Cradle-to-gate with modules C1-C4 and D □Cradle-to-gate with options, modules C1-C4 and D ⊠Cradle-to-grave and module D □Cradle-to-gate □Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

⊠ external

internal

Third party verifier:

Seter Caril Dametsson

Stefan Emil Danielsson

senser

Martha Katrine Sørensen EPD Danmark

Life	ife cycle stages and modules (MND = module not declared)															
	Produc	t	Consti pro	ruction cess		Use			End of life			of life		Beyond the system boundary		
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	Х	X	X	X	X	X	X	X	X	X	X	X	X	X	x





Product information

Product description

The main product components are shown in the table below.

Material	Weight-% of declared product
Galvanized steel	100%

Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below.

Material	Weight-% of packaging
Таре	0,2%
Steel strip	1,5%
Wood block	55,4%
Wood pallet	43,9%

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of Triplan steel building profiles on the production site located in Ishøj, Denmark. Product specific data are based on consumption- and production data collected in the period 01.08.2021 to 30.09.2022.

Background data are based on LCA for Experts version 10.7 databases and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Hazardous substances

The product covered in this EPD does not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation".

(http://echa.europa.eu/candidate-list-table)

Product(s) use

Light steel profiles and components for use in the building construction industry, for e.g. drywalls, exterior walls, suspended ceilings, and loadbearing floor slabs.

Essential characteristics

Triplan steel building profiles are covered by harmonised European product standards, and all components are CE-marked products. The profiles are fire- and sound tested at Danish laboratories, and MK-approved.

Further technical information can be obtained by contacting the manufacturer or on the manufacturers website:

https://www.triplan.dk/en

Reference Service Life (RSL)

The product covered in this EPD has an estimated service life of 80 years cf. Annex 4 in "BUILD rapport 2021:32 – BUILD levetidstabel version 2021".

Picture of product(s)







LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1 ton steel building profiles.

Name	Value	Unit
Declared unit	1	ton
Density	-	kg/m ³
Conversion factor to 1 kg.	0,001	-

Important notice

The results of this EPD relate to 1 ton steel building profiles. The fraction of material waste during installation is project specific, and it is therefore important to account for the amount of steel installed and the material waste during installation, when calculating the environmental impacts of a construction project. In this EPD 5% material waste is assumed, and the impacts from additional production processes to compensate for the loss of wastage of products is accounted for in A5.

Functional unit

Not defined.

Flowdiagram



The flow diagram below presents the main processes included in the life cycle of the steel building profiles.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804:2012+A2:2019, which serves as the core PCR, and NPCR 013 Part B for Steel and Aluminium Construction Products (EPD-Norge, 2021) as the cPCR.

Guarantee of Origin – certificates

Foreground system:

At the production site, electricity from European wind power covered by GO is used. Remaining energy processes in A1 – A3 are modelled using residual mix from the background database.

Background system:

Upstream and downstream processes in the background system are modelled using grid mix from the background database.





System boundary

This EPD is based on a cradle-to-grave and module D LCA, in which 100 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

- A2 Transport to the production site
- A3 Manufacturing processes

Triplan steel building profiles are manufactured at a modern mechanical industrial plant, utilizing fully automated bending- and packaging machines, robots, and machines for drywall processing. The plant produces steel in the shape of battens, rails, and posts for use in drywalls, suspended ceilings, and loadbearing floor slabs.

The plant also has the capabilities and advanced equipment to manufacture specialized steel profiles, as well as thin steel plates.

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the "end-of-waste" state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

The production of electrical energy, resulting from the disposal of waste in municipal waste incineration, is allocated within the system boundary, and the generated electrical energy is deducted from the consumption.

Screws and other ancillary materials are not included in this EPD, due to variations in type of materials used and manufacturer. Any such components are to be included separately.

Construction process stage (A4-A5) includes:

A4 – Transport to construction site

A5 – Installation

The steel building profiles produced by Triplan, are sold within Denmark.

From the factory gate, the steel building profiles are transported to the construction site. The transport scenario is based on an average distance and means of transportation.

The installation stage comprises packaging and material waste processing up to the "end-ofwaste" state or final disposal. Recycled steel and energy recovered from waste incineration is declared in module D.

Triplan produces both profiles to standard dimensions, as well as custom-made profiles. When installing standard profiles there will, in some cases, be a need to adapt the profile to the purpose of use. An average material waste of 5% is assumed. The impacts from additional production processes to compensate for the loss of wastage of products is accounted for in A5.

It is assumed that the installation of steel building profiles is a primarily manual process, hence no energy consumption is considered.

Use stage (B1-B7) includes:

There are no activities in B1-B7.

It is assumed that after installation, and under normal conditions of use, there is not a need for maintenance, repairs, replacements or renovation of the steel building profiles. There is also no energy/water consumption associated with the steel building profiles during the use phase.

End of Life (C1-C4) includes:

End of life includes a Danish scenario for waste processing of steel. End-of-life is modelled using a 100% recycling scenario, where 95% steel is recovered and 5% is sent to landfilling.

C1 – Deconstruction/demolition

C2 – Transport to recycling





C3 – Waste processing

C4 – Landfilling

The steel building profiles are removed from the construction into which it is built, by demolition of the construction. The energy consumption during demolition is connected to the operation of the machinery used.

From the building site, the steel building profiles are transported to a waste handling site. The transport scenario is based on an average distance and means of transportation.

At the waste handling site, steel waste undergoes shredding/treatment. It is assumed that 95% of the steel waste is recycled and used as secondary material in the production of new steel products. Recycled steel is declared in module D.

The residual fraction from the processing of steel waste, corresponding to 5% shredder fluff, is disposed of as landfill waste.

Re-use, recovery and recycling potential (D) includes:

The recovered steel is modeled as avoided production of virgin steel. In accordance with the guidelines in EN15804+A2, only the fraction of virgin steel in the product is credited in module D.

Energy recovered from waste incineration is modeled as avoided production of Danish electricity and heat.





LCA results

		ENVIRO	NMENTAL	IMPACTS	PER TON	STEEL BL		ROFILE				
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D		
GWP-total	[kg CO ₂ eq.]	2,70E+03	8,75E+00	1,68E+02	0,00E+00	4,21E+00	4,29E+00	1,15E+01	7,17E-01	-1,72E+03		
GWP-fossil	[kg CO ₂ eq.]	2,73E+03	8,65E+00	1,38E+02	0,00E+00	4,16E+00	4,24E+00	1,14E+01	7,40E-01	-1,72E+03		
GWP- biogenic	[kg CO ₂ eq.]	-2,89E+01	1,98E-02	2,98E+01	0,00E+00	1,99E-02	9,72E-03	9,50E-02	-2,55E-02	-4,31E-01		
GWP-luluc	[kg CO ₂ eq.]	7,51E-01	8,10E-02	4,48E-02	0,00E+00	3,81E-02	3,98E-02	2,44E-03	2,33E-03	-6,47E-01		
ODP	[kg CFC 11 eq.]	6,11E-10	1,14E-12	4,86E-11	0,00E+00	5,35E-13	5,59E-13	2,89E-10	1,91E-12	-1,13E-09		
AP	[mol H⁺ eq.]	7,10E+00	1,30E-02	3,64E-01	0,00E+00	5,71E-02	6,40E-03	2,17E-02	5,33E-03	-4,00E+00		
EP- freshwater	[kg P eq.]	1,41E-03	3,20E-05	7,92E-05	0,00E+00	1,50E-05	1,57E-05	9,20E-05	1,51E-06	-1,32E-03		
EP-marine	[kg N eq.]	1,57E+00	4,76E-03	8,07E-02	0,00E+00	2,58E-02	2,34E-03	7,25E-03	1,38E-03	-9,80E-01		
EP- terrestrial	[mol N eq.]	1,69E+01	5,62E-02	8,83E-01	0,00E+00	2,84E-01	2,76E-02	6,98E-02	1,51E-02	-1,06E+01		
POCP	[kg NMVOC eq.]	5,60E+00	1,15E-02	2,86E-01	0,00E+00	8,36E-02	5,62E-03	1,69E-02	4,15E-03	-3,35E+00		
ADPm ¹	[kg Sb eq.]	3,02E-02	5,80E-07	1,51E-03	0,00E+00	2,73E-07	2,85E-07	4,72E-06	3,47E-08	-6,82E-05		
ADPf ¹	[MJ]	3,30E+04	1,19E+02	1,68E+03	0,00E+00	5,60E+01	5,85E+01	1,55E+02	1,00E+01	-1,46E+04		
WDP ¹	[m ³ world eq. deprived]	-3,33E+02	1,06E-01	-1,31E+01	0,00E+00	4,97E-02	5,19E-02	1,36E+00	8,25E-02	-2,29E+01		
Caption	GWP-total = G biogenic; GW Eutrophication – a zone formation; The numbers a	GWP-total = Globale Warming Potential - total; 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential										
				1,12	2*10 ⁻¹¹ or 0,00	00000000112.						
Disclaimer	¹ The results of th	is environment	al indicator sha	II be used with	care as the und the indic	certainties on th ator.	ese results are	high or as ther	e is limited exp	erienced with		

	ADDITIONAL ENVIRONMENTAL IMPACTS PER TON STEEL BUILDING PROFILE											
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D		
PM	[Disease incidence]	2,83E-04	1,08E-07	1,42E-05	0,00E+00	2,29E-06	5,30E-08	1,78E-07	6,55E-08	-5,81E-05		
IRP ²	[kBq U235 eq.]	3,16E+01	3,34E-02	1,70E+00	0,00E+00	1,57E-02	1,64E-02	1,85E+00	1,31E-02	-7,79E+00		
ETP-fw ¹	[CTUe]	4,94E+03	8,54E+01	2,58E+02	0,00E+00	4,02E+01	4,19E+01	4,27E+01	6,29E+00	-2,79E+03		
HTP-c ¹	[CTUh]	1,60E-06	1,73E-09	8,05E-08	0,00E+00	8,13E-10	8,51E-10	7,93E-09	8,40E-10	-2,35E-06		
HTP-nc ¹	[CTUh]	1,08E-05	7,71E-08	5,66E-07	0,00E+00	3,71E-08	3,78E-08	5,24E-08	8,87E-08	-5,53E-06		
SQP ¹	-	2,22E+04	4,98E+01	1,13E+03	0,00E+00	2,34E+01	2,45E+01	2,70E+02	2,43E+00	-9,42E+02		
Oration	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)											
Caption	The numbers are	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 11 or 0,000000000112.										
-	¹ The results of	f this environme	ental indicator sł	nall be used wit	h care as the ur the indi	ncertainties on t cator.	hese results ar	e high or as the	re is limited exp	perienced with		
Disclaimers	² This impact ca effects due t	This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil. from radon and from some construction materials is also not measured by this indicator.										





	RESOURCE USE PER TON STEEL BUILDING PROFILE									
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	[MJ]	3,28E+03	8,68E+00	2,02E+02	0,00E+00	4,08E+00	4,26E+00	4,11E+02	1,63E+00	-9,07E+02
PERM	[MJ]	3,41E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	3,62E+03	8,68E+00	2,02E+02	0,00E+00	4,08E+00	4,26E+00	4,11E+02	1,63E+00	-9,07E+02
PENRE	[MJ]	3,30E+04	1,20E+02	1,68E+03	0,00E+00	5,62E+01	5,87E+01	1,55E+02	1,00E+01	-1,47E+04
PENRM	[MJ]	9,02E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	3,30E+04	1,20E+02	1,68E+03	0,00E+00	5,62E+01	5,87E+01	1,55E+02	1,00E+01	-1,47E+04
SM	[kg]	1,66E+02	0,00E+00	8,32E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m ³]	-3,83E+00	9,50E-03	-1,02E-01	0,00E+00	4,46E-03	4,66E-03	1,18E-01	2,53E-03	-2,20E+00
Caption	Image:									

	WASTE CATEGORIES AND OUTPUT FLOWS PER TON STEEL BUILDING PROFILE									
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	3,77E-04	3,70E-10	1,88E-05	0,00E+00	1,74E-10	1,82E-10	-1,46E-07	2,18E-10	4,36E-07
NHWD	[kg]	5,99E+01	1,82E-02	6,07E+00	0,00E+00	8,57E-03	8,95E-03	6,23E-01	5,00E+01	-2,18E+01
RWD	[kg]	6,52E-02	2,24E-04	4,28E-03	0,00E+00	1,05E-04	1,10E-04	1,63E-02	1,14E-04	-8,46E-02
	-			-		-	-	-	-	
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	8,35E+01	0,00E+00	5,21E+01	0,00E+00	0,00E+00	0,00E+00	9,50E+02	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	4,60E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	9,34E+00	0,00E+00	2,11E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Contion	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									
Caption The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as ¹¹ or 0,000000000112.						ame as 1,12*10 ⁻				

BIOGENIC CARBON CONTENT PER TON STEEL BUILDING PROFILE							
Parameter	Unit	At the factory gate					
Biogenic carbon content in product	[kg C]	0,00E+00					
Biogenic carbon centent in accompanying packagaing	[kg C]	8,08E+00					
Note		1 kg biogenic carbon is equivalent to $44/12$ kg of CO ₂					





Additional information

LCA interpretation

A contribution analysis has been conducted with the aim of identifying which processes and materials contribute the most to the core environmental impacts. Overall, the results show that the greatest environmental impacts take place in the life cycle modules A1 - A3. From the contribution analysis, it appears that the production of steel in A1 has the largest contribution to the overall results in most impact categories across all declared life cycle modules.

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Unit
Fuel type	Diesel mix, 6.91 wt.% share bio C	-
Vehicle type	Truck, Euro 6 A-C, 28 - 32t gross weight / 22t payload capacity	-
Transport distance	100	km
Capacity utilisation (including empty runs)	61	%
Gross density of products transported	1018	kg/ton
Capacity utilisation volume factor	1	-

Installation of the product in the building (A5)

Scenario information	Value	Unit
Ancillary materials	-	kg
Water use	-	m ³
Other resource use	-	kg
Energy type and consumption	-	kWh
Waste materials (packaging)	18	kg
Waste materials (material waste)	50	kg
Output materials	1000	kg
Direct emissions to air, soil or water	-	kg

Reference service life

RSL information	Unit		
Reference service Life	80 years		
Declared product properties			
Design application parameters			
Assumed quality of work	Technical specifications and guidance can be obtained from t		
Outdoor environment	company's website https://www.triplan.dk/en or from direct		
Indoor environment	contact to Triplan at +45 4353 9999 or <u>triplan@triplan.dk</u> .		
Usage conditions			
Maintenance			

Use (B1-B7)

There are no activities in B1-B7.





End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	1000	kg
Collected with mixed waste	0	kg
For reuse	0	kg
For recycling	950	kg
For energy recovery	0	kg
For final disposal	50	kg
Assumptions for scenario development	Assumed to be 100% recycling	-

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Displaced material, steel (A5)	41	kg
Displaced material, steel (C3)	808	kg
Energy recovery from waste incineration (A5)	249	MJ

Note: The recovered steel is modeled as avoided production of virgin steel. In accordance with the guidelines in EN15804+A2, only the fraction of virgin steel in the product is credited in module D.





Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.





References

Publisher	www.epddanmark.dk Template version 2023.1
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Line Granheim Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA software /background data	LCA for Experts version 10.7, 2023.1 including databases. <u>www.gabi-software.com</u>
3 rd party verifier	Stefan Emil Danielsson Circonomy Consulting

General programme instructions

General Programme Instructions, version 2.0, spring 2020 www.epddanmark.dk

EN 15804

DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

NPCR 013

NPCR 013:2019 – "Part B for Steel and Aluminium Construction Products"

EN 15942

DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025

DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040

DS/EN ISO 14040:2008 – " Environmental management – Life cycle assessment – Principles and framework"





ISO 14044

DS/EN ISO 14044:2008 – " Environmental management – Life cycle assessment – Requirements and guidelines"