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3rd PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



Owner of declaration

KNAUF A/S
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Issued:
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Program operator

EPD Danmark
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- | | |
|---|---|
| ☐ Industry EPD | ☐ Product specific |
| ☒ Product EPD | ☒ Average |
| | ☐ Worst Case |

Declared product(s)

Light gauge steel profiles.

- Steel 1a: DX51D+Z140, t=0,56 mm
- Steel 2a: S250GD+Z100, t=0,46 mm
- Steel 3a: S250GD+Z275, t=0,90 mm
- Steel 3b: S250GD+Z275, t=1,00 mm
- Steel 3c: S250GD+Z275, t=1,50 mm
- Steel 4a: S350GD+Z275, t=1,00 mm
- Steel 4b: S350GD+Z275, t=1,25 mm
- Steel 4c: S350GD+Z275, t=1,50 mm
- Steel 4d: S350GD+Z275, t=2,00 mm
- Steel 4e: S350GD+Z275, t=2,50 mm
- Steel 4f: S350GD+Z275, t=3,00 mm

Number of declared datasets/product variations: 11

Production site

Ib Andresen Industri A/S
 Industrivej 12-20
 DK-5550 Langeskov, Denmark

Use of Guarantees of Origin

- ☒ No certificates used
☐ Electricity covered by GoO
☐ Biogas covered by GoO

Declared/ functional unit

1 kg of light gauge steel profile.

Year of production site data (A3)

2025

EPD version

1

Basis of calculation

This EPD is developed and verified in accordance with the European standard EN 15804:2012+A2:2019.

Comparability

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.

Validity

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

☐ internal ☒ external

Third party verifier:

Mirko Miseljic
 LCA Specialists

Martha Katrine Sørensen
 EPD Danmark

Life cycle stages and modules (MND = module not declared)

Product			Construction process		Use							End 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-contruction 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	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Product information

Product description

Light gauge steel profiles are roll-formed from hot dip galvanized carbon steel coil. The profiles are supplied with different zinc coating weights in order to obtain an intact protective surface on the product; products used in internal and external walls and ceilings have a surface layer between 100–275g zinc per square meter, corresponding to 7–20µm per side. Steel grades are designated in accordance with EN 10027-1, where e.g. S250GD+Z100 denotes a structural steel (S) with a specified yield strength of 250MPa and a plain zinc surface layer of 100g per square meter (Z100). Where requirements to noise reduction apply, the profiles can be mounted with sealing strips and isolation sheets.

The declaration covers eleven product variations in four steel grades: DX51D+Z140 (0,56mm), S250GD+Z100 (0,46mm), S250GD+Z275 (0,90–1,50mm) and S350GD+Z275 (1,00–3,00mm). The 0,46–1,50mm variations are intended for steel profiles for interior walls and ceilings, while the 1,00–3,00mm variations can additionally be used for external walls. All variations are manufactured in accordance with EN10346:2015 and have a declared width of 45mm.

The steel grade and steel thickness of each declared product are shown in the table below.

Steel no.	Steel grade	Thickness mm
Steel 1a	DX51D+Z140	0,56
Steel 2a	S250GD+Z100	0,46
Steel 3a	S250GD+Z275	0,90
Steel 3b		1,00
Steel 3c		1,50
Steel 4a	S350GD+Z275	1,00
Steel 4b		1,25
Steel 4c		1,50
Steel 4d		2,00
Steel 4e		2,50
Steel 4f		3,00

The main product components are shown below, as weight percentages of the declared unit for each of the eleven declared datasets.

Steel no.	Steel	Zinc	Total
Steel 1a	96,74	3,26	100,00
Steel 2a	97,22	2,78	100,00
Steel 3a	95,94	4,06	100,00
Steel 3b	96,35	3,65	100,00
Steel 3c	97,57	2,43	100,00
Steel 4a	96,35	3,65	100,00
Steel 4b	97,08	2,92	100,00
Steel 4c	97,57	2,43	100,00
Steel 4d	98,18	1,82	100,00

Steel no.	Steel	Zinc	Total
Steel 4e	98,54	1,46	100,00
Steel 4f	98,79	1,21	100,00

Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below as well as the weight per unit declared. The products are transported to the customers on wooden spacers with plastic straps. The straps are not included in the EPD. Furthermore, as module A5 has not been declared, the release of biogenic carbon has been declared in module A3, equivalent to this packaging's uptake in module A1 of 0,0168 kgCO₂eq.

Material	packaging (kg)	W/W-% of packaging
Wooden spacers	0,01	100

Representativity

This declaration, including data collection and the modelled foreground system including results, represents the production of light gauge steel profiles on the production site located at Industrivej 12-20, DK-5550 Langeskov, Denmark. Foreground data is based on specific product composition and production data based on average values for the calendar year 2025, metered at IAI's facility, which manufactures the profiles declared under Knauf A/S ownership. Background data are taken from the ecoinvent database version 3.12, EN15804+A2 system model (2025), supplemented by product-specific EPDs from the two hot-dip galvanised coil suppliers used specifically in producing these steel profiles, and are two years old. Impacts are characterised with the EN15804 reference package EF3.1.

Data quality

Data quality is assessed in accordance with EN 15941 using Table E.1 of EN 15804+A2. The hot-dip galvanised steel coils, which dominate the results, are represented by the product-specific EN15804+A2 EPDs of the two coil suppliers (EPD-IES-0023967, EPD-IES-0014421) and are rated very good for technological and geographical representativeness and good for time representativeness. The impacts from both these EPDs declare a single weighted average impact result based on production volumes, covering the supplier's full range of steel grades, coatings and thicknesses. This range appropriately represents

the products declared in this EPD. While the supplier EPDs results that are used in this EPD have been averaged, the results representing the declared products in this EPD have not been. The results in this EPD, covering the 11 products, are provided pr kg of product and are classified as average EPD results. This is due to the large influence of the two main materials and EPDs used as secondary data.

The remaining background datasets range from very good to fair depending on their temporal, geographical and technological representativeness. No dataset assessed as poor or very poor is used, and no fair dataset contributes more than 30% to any core environmental indicator.

Hazardous substances

Light gauge steel profiles do not contain substances listed on the "Candidate List of Substances of Very High Concern for authorization"

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

Product(s) use

The profiles are primarily used for the mounting of sheet materials in the construction of interior or exterior walls and ceilings.

The profiles are available with different types of surface treatment. Products used in internal walls and ceilings have the steel grade DX51D/S250, a surface layer zinc coating of 100–275g per square meter with a profile thickness of 0,46–1,5mm and a corrosion class of C1–C2. While the 1,00–3,00mm variations in steel grade S350GD+Z275 can be used in exterior walls and light steel beams.

Essential characteristics

Light gauge steel profiles are covered by harmonised technical specifications EN10346:2015.

Declaration of performance according to EU regulation 305/2011 is available for all declared product variations. The corrosion class of the declared products is C1–C2 for the interior variations and C2–C3 for the exterior variations.

Further technical information can be obtained by contacting the manufacturer or on the manufacturer's website: <https://iai.dk/dokumenter>

As well as the owner's website: www.knauf.dk

Reference Service Life (RSL)

The product has a reference service life of 60 years. The declared steel products 1a,2a,3a-c used in internal structures are designated with a corrosion class of C1–C2, and products 4a-f used in external structures with a C2–C3 designation in accordance with EN ISO 9224, supporting a service life of 60 years. The thickness of the zinc coating determines the duration of protection. When galvanized steel is exposed to atmospheric conditions, there is a linear relationship between the thickness of the zinc coating and the life expectancy, which is expressed through the corrosion class designations. The reference service life is stated for information only, as the use stage (B1–B7) is not declared in this EPD. Furthermore, these values are supported by industry values for lifetimes of stainless steel in inner and outer wall building constructions, as well as surface-mounted ceilings in Builds lifetime tables 2021. These values are conditioned on the steel profiles being sealed off in wall and surface mounted ceiling constructions in dry environments not exposed directly to outdoor elements and excludes use in basement constructions.

Picture of product(s)



The technical data and essential characteristics for each of the declared steel profiles are presented in the tables below.

Steel no.	1a	2a	3a-c	4a-f
Steel grade	DX51D+Z140	S250GD+Z100	S250GD+Z275	S350GD+Z275
Product objectives	Material of 0,56 mm thickness for use in steel profiles for interior walls and ceilings.	Material of 0,46 mm thickness for use in steel profiles for interior walls and ceilings.	Material of 0,9 – 1,5 mm thickness for use in steel profiles for interior walls and ceilings.	Material of 1–3 mm thickness for use in steel profiles for external walls and light weight steel beams.
Steel				
Manufactured in accordance with European standard	EN 10346:2015			
Iron weight (w-%)	97,655	97,35	97,35	97,35
Carbon weight (w-%)	0,18	0,2	0,2	0,2
Silicon weight (w-%)	0,5	0,6	0,6	0,6
Manganese weight (w-%)	1,2	1,7	1,7	1,7
Phosphorus weight (w-%)	0,12	0,1	0,1	0,1
Sulfur weight (w-%)	0,045	0,045	0,045	0,045
Titanium weight (w-%)	0,3	–	–	–
Coating				
Coating	Hot galvanized			
Coating thickness per side (µm)	10	7	20	20
Coating total weight (g/m ²)	140	100	275	275
Zinc weight (w-%)	3,3	2,8	2,4 – 4,1	1,2 – 3,7
Corrosion class	C1 – C2	C1 – C2	C1 – C2	C2 – C3

Characteristic	Value	Standard / basis
Harmonised technical specification	EN 10346:2015 - continuously hot-dip coated steel flat products for cold forming	EN 10346:2015
Declaration of Performance	Available from the manufacturer for all declared product variants	EU Regulation 305/2011
Steel grade designations	DX51D, S250GD, S350GD	EN 10027-1; EN 10346:2015
Specified minimum yield strength	S250GD: 250 MPa; S350GD: 350 MPa; DX51D: forming grade, no specified yield strength	EN 10346:2015
Coating type	Hot-dip zinc coating (Z), applied by the coil supplier	EN 10346:2015
Coating weight	Z100 (100g/m ²), Z140 (140g/m ²), Z275 (275g/m ²), both surfaces combined	EN 10346:2015; EN ISO 1461; EN ISO 14713
Nominal thickness range	0,46mm – 3,00mm	EN 10346:2015
Corrosivity category	C1–C2 for interior walls and ceilings; C2–C3 for exterior walls and light weight steel beams.	As reported by Ib Andresen Industri A/S; EN ISO 9223:2012
Density of steel substrate	7.847kg/m ³	As reported by Ib Andresen Industri A/S
Density of zinc coating	7.140kg/m ³	As reported by Ib Andresen Industri A/S
Ageing resistance	60 years	EN ISO 9224:2012, based on corrosion resistance environment and zinc coating thickness.

LCA background

Declared unit

The LCI and LCIA results in this EPD relate to 1 kg of light gauge steel profile.

Name	Value	Unit
Declared unit	1	kg

Functional unit

Not declared, as the use phase is not included in this EPD.

Material properties

The declared unit is expressed on a mass basis. The mass factor is therefore 1kg per declared unit for all eleven declared datasets.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN15804:2012+A2:2019, and the supplementary requirements of EPD Danmark's General Programme Instructions, version 3.0, April 2025. No complimentary product category rules (c-PCR) specific to light gauge steel profiles are available.

Conversion factors

N.D.

Energy modelling principles

Foreground system:

The product is produced using residual grid mix electricity in processes for slitting and form rolling steel coils as well as lighting and heating at the production facility, together with natural gas for additional heating. Electricity consumption is a measured process value of 0,130kWh per kg of product. Both energy carriers are modelled using country specific datasets. No Guarantees of Origin have been applied for electricity or for heating.

Information about the energy mix in the foreground system:

Energy mix	EF	Unit
electricity, medium voltage, residual mix.	0,530	kg CO ₂ e/kWh
Heat from natural gas fueled boiler.	0,074	kg CO ₂ e/MJ

The emission factors above are taken from the following background datasets in ecoinvent 3.12, EN 15804+A2 system model: "Electricity,

medium voltage, residual mix | DK"; and "heat production, natural gas, at boiler modulating >100kW | Europe without Switzerland".

Background system:

For processes both upstream and downstream of the production process declared in module A3, the background data for electricity consumption is based on average national electrical grid mix consumptions as opposed to a residual grid mix as with the foreground system. To do otherwise is not possible for background data within the Ecoinvent datasets.

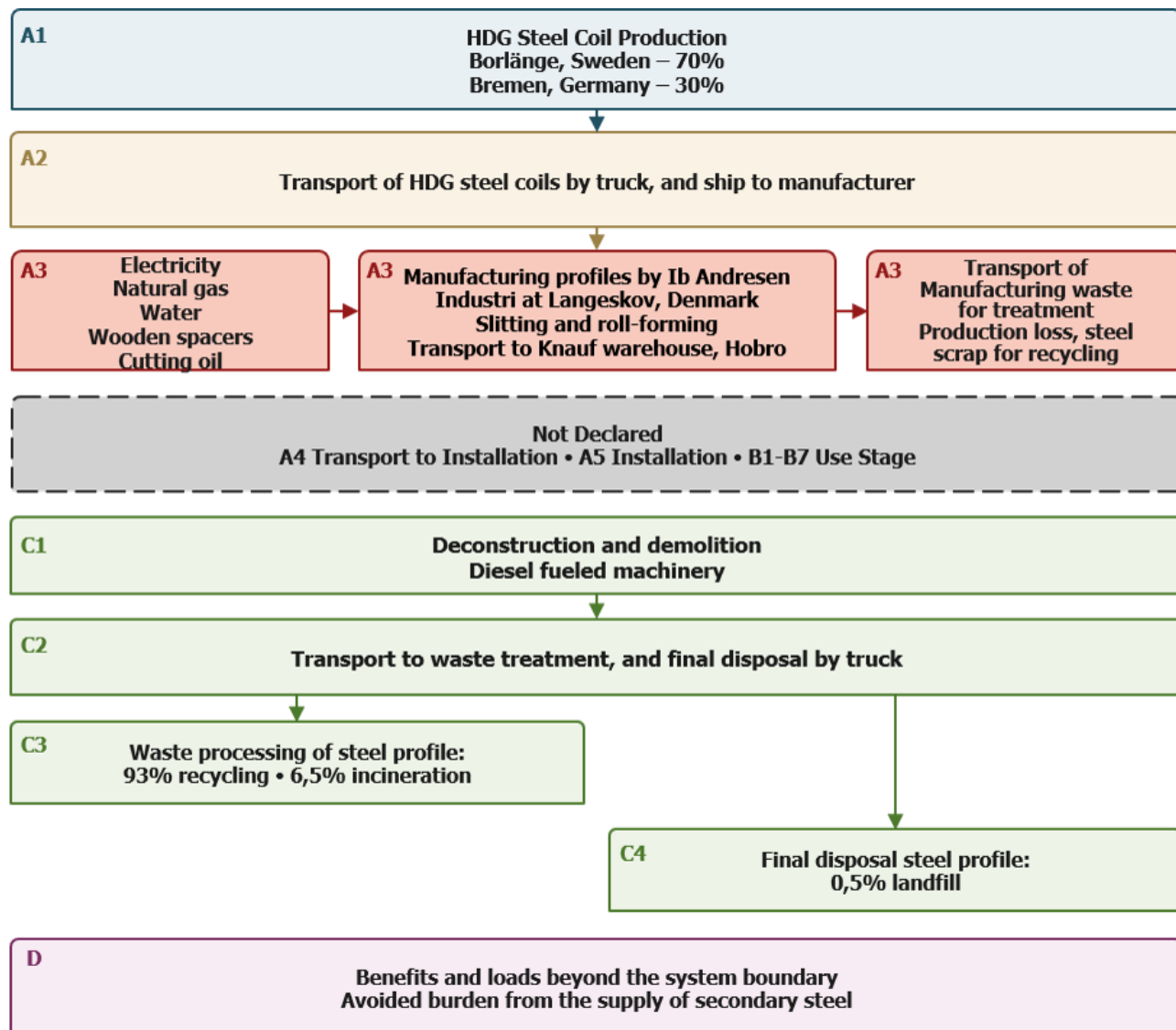
Allocation

No co-product allocation is required. Manufacturing consists of coil slitting and roll forming and yields no significant co-products. The steel scrap arising from slitting and roll forming reaches the end-of-waste state within module A3, is reported as material for recycling and is not credited in module D.

Site-level data are allocated on a mass basis. The annual quantities reported by the manufacturer for natural gas, water, the process oil emulsion, and every waste fraction cover the entire production at the Langeskov site and are allocated to the declared products in proportion to the mass produced, uniformly. Electricity is the exception; it is a measured process value for the equipment used in slitting and roll forming the declared products rather than an allocated share of a site total. Allocation applied within the background data, including the treatment of the recycled content of the coil in the two supplier EPDs, is inherited.

Flow Diagram

An overview of the product system studied is presented in the diagram below. The system includes the production of the hot-dip galvanised steel coil by the two suppliers and its transport to IAI's facility in Langeskov, where the coils are roll-formed and cut into steel profiles. Auxiliary materials, utilities, packaging and waste treatment, as well as the transport of the finished profiles to Knauf's warehouse are also included, as well as the end-of-life treatment of the product, and the loads and benefits beyond the system boundary. Transport to construction site, Installation, and use is not declared.



System boundary

This EPD is based on a cradle-to-gate LCA with modules C1-C4 and module D, in which 100 weight-% of the declared product has been accounted for.

The general rules for the exclusion of inputs and outputs follow the requirements in EN15804, 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

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 profiles are manufactured from hot dip galvanized carbon steel coil delivered from the steelworks by sea and onwards by road to the production site in Langeskov by truck. At the production site the coil is cut into narrow bands whose width fits the specific profile, and the profiles are subsequently manufactured through roll forming technique.

A1 comprises extraction and processing of raw materials, i.e. the mining of iron ore and zinc, use of secondary steel, and the manufacturing of the hot rolled steel coils in the required alloy, including the zinc coating.

A2 comprises transport of the hot-dip galvanised steel coil from the two suppliers to the production site: approximately 70% from SSAB Europe Oy in Borlänge, Sweden, and approximately 30% from ArcelorMittal Europe in Bremen, Germany, by sea and road via the port in Nyborg.

A3 comprises the manufacturing processes at the production site: slitting of the hot rolled coils and roll forming of the steel into the various widths, thicknesses required by the ordered profile, and packaging of the products for the customers on wooden spacers. A3 furthermore includes services such as electricity, heating and water, as well as waste and emissions to air, land and water from manufacturing. Transport from IAI's facility in Langeskov to Knauf's warehouse in Hobro is also declared here.

Exported energy arising from the incineration of production waste in module A3 is declared as EEE and EET, as well as production waste sent for recycling being credited with MFR.

Construction process stage (A4-A5) includes:

N.D.

Use stage (B1-B7) includes:

N.D.

End of Life (C1-C4) includes:

C1: De-construction and demolition of the construction into which the steel profiles are built.

C2: Transport of the waste from the construction site to waste processing sites or disposal.

C3: Waste processing, i.e. sorting of scrap steel. Steel is a highly recyclable building material; once steel has been made, it can be recycled without weakening its properties. The end-of-life scenario is taken from the Danish Environmental Protection Agency's waste statistics (Miljøstyrelsens Affaldsstatistik 2022, revised 2024), figure 3.3, for the grouping Jernhandel, which reports 93% recycling, 6,5% incineration and 0,5% landfill. Material sent for recycling has been credited with MFR. The scenario is based on the Danish context in line with the Danish geographical scope as the declared products are only sold to Knauf in Denmark.

C4: Disposal of the remaining fraction of the profiles, by landfill.

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

Module D declares the potential benefits and loads beyond the system boundary arising from the net output flow of scrap steel leaving the product system in module C3. The credit is taken from the module D declarations of the two coil suppliers, which already contain the net-scrap substitution credit for the hot-dip galvanised coil, and is corrected from the suppliers' assumed 98% recycling rate to the 93% rate applied in this study in line with the Danish geographical scope.

Potentials for energy recovery are not declared for the end-of-life stage, as no component of the product leaving the system in module C3 is subject to incineration with energy recovery.

LCA results

The LCIA results are calculated from the model built using the Dawn platform with LCA datasets sourced from ecoinvent's database version 3.12, EN 15804+A2 system model (2025), and supplemented by the product-specific EPDs of the two hot-dip galvanised steel coil suppliers. Impacts are characterised by the EN 15804 reference package EF 3.1.

The eleven declared product variants vary slightly in steel grade, thickness and zinc coating. The 11 products impact per declared unit are identical. The results have therefore been combined into one table for each impact category. This is due to the impacts of producing the hot dip galvanised steel coils represented by EPDs from IAI's two suppliers, (EPD-IES-0023967, EPD-IES-0014421), declare a single weighted average impact result based on production volumes, covering the supplier's full range of steel grades, coatings and thicknesses, as well as the products declared in this EPD being made exclusively from these coils, with the same use of resources in manufacturing. While the supplier EPDs results that are used in this EPD are averaged, the results representing the declared products in this EPD have not been.

Table 1 - Core environmental impact indicators

ENVIRONMENTAL IMPACTS PER KG OF STEEL PROFILE 1a, 2a, 3a-c, 4a-f							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	2,47E+00	3,08E-02	5,10E-03	2,19E-02	3,13E-05	-1,43E+00
GWP-fossil	[kg CO ₂ eq.]	2,48E+00	3,08E-02	5,09E-03	2,22E-02	3,13E-05	-1,43E+00
GWP-biogenic	[kg CO ₂ eq.]	-2,21E-03	4,99E-06	2,73E-06	-2,92E-04	9,91E-09	2,87E-03
GWP-luluc	[kg CO ₂ eq.]	7,28E-04	3,11E-06	1,85E-06	2,36E-05	1,78E-08	-1,91E-04
ODP	[kg CFC 11 eq.]	2,29E-09	4,74E-10	1,20E-10	3,22E-10	9,14E-13	1,92E-12
AP	[mol H ⁺ eq.]	5,81E-03	2,75E-04	1,20E-05	2,54E-04	2,16E-07	-3,50E-03
EP-freshwater	[kg P eq.]	4,04E-05	9,87E-07	3,76E-07	1,51E-05	2,76E-09	-3,34E-07
EP-marine	[kg N eq.]	1,63E-03	1,29E-04	3,33E-06	5,81E-05	8,54E-08	-5,63E-04
EP-terrestrial	[mol N eq.]	1,74E-02	1,41E-03	3,59E-05	6,53E-04	9,29E-07	-5,04E-03
POCP	[kg NMVOC eq.]	4,96E-03	4,23E-04	2,12E-05	1,94E-04	3,36E-07	-2,29E-03
ADPm ¹	[kg Sb eq.]	5,19E-05	1,12E-08	1,53E-08	1,48E-06	4,75E-11	-8,11E-06
ADP ^f	[MJ]	2,89E+01	3,99E-01	1,32E-01	2,97E-01	7,64E-04	-1,42E+01
WDP ¹	[m ³ world eq. deprived]	2,14E-01	1,00E-03	4,43E-04	5,88E-03	3,36E-05	-9,63E-02
Caption	GWP-total = Global 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 = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical ozone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential						
	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 0,0000000000112.						

Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.
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Table 2 – Additional environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER KG OF STEEL PROFILE 1a, 2a, 3a-c, 4a-f							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PM	[Disease incidence]	4,27E-09	7,86E-09	5,05E-10	3,62E-09	5,06E-12	0,00E+00
IRP ²	[kBq U235 eq.]	1,40E-02	1,67E-04	8,27E-05	2,25E-03	4,41E-07	0,00E+00
ETP-fw ¹	[CTUe]	2,22E-01	4,05E-02	1,04E-02	1,89E-01	9,54E-05	0,00E+00
HTP-c ¹	[CTUh]	2,29E-11	2,95E-12	8,13E-13	1,94E-11	5,48E-15	0,00E+00
HTP-nc ¹	[CTUh]	7,90E-10	5,25E-11	4,76E-11	1,28E-09	1,33E-13	0,00E+00
SQP ¹	-	9,38E-01	2,76E-02	7,76E-02	5,65E-01	1,51E-03	0,00E+00
Caption	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)						
	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 0,0000000000112.						
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.						
	² 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.						

Table 3 - Parameters describing resource use

RESOURCE USE PER KG OF STEEL PROFILE 1a, 2a, 3a-c, 4a-f							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	[MJ]	1,56E+00	2,50E-03	2,20E-03	5,26E-02	7,11E-06	5,62E-01
PERM	[MJ]	1,46E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	1,71E+00	2,50E-03	2,20E-03	5,26E-02	7,11E-06	5,62E-01
PENRE	[MJ]	2,89E+01	3,99E-01	1,32E-01	2,97E-01	7,64E-04	-1,42E+01
PENRM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	2,89E+01	3,99E-01	1,32E-01	2,97E-01	7,64E-04	-1,42E+01
SM	[kg]	6,18E-02	1,65E-04	6,01E-05	3,69E-04	1,90E-07	0,00E+00
RSF	[MJ]	2,02E-03	4,35E-07	7,91E-07	1,65E-05	3,98E-09	0,00E+00

NRSF	[MJ]	5,64E-25	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m³]	8,23E-03	2,40E-05	1,58E-05	1,35E-04	7,89E-07	-1,45E-01
Caption	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 = Net use of fresh water						
	The numbers are declared in scientific notation, e.g. 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 0,0000000000112.						

Table 4 – End-of-life (waste categories and output flows)

WASTE CATEGORIES AND OUTPUT FLOWS PER KG OF STEEL PROFILE 1a, 2a, 3a-c, 4a-f							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	[kg]	1,79E-02	1,30E-03	4,34E-04	4,26E-02	2,48E-06	-1,07E-07
NHWD	[kg]	3,19E-01	6,46E-03	9,02E-03	2,34E-01	5,02E-03	1,18E-01
RWD	[kg]	1,63E-04	3,92E-08	1,99E-08	5,66E-07	1,04E-10	1,56E-06
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	2,61E-02	0,00E+00	0,00E+00	9,30E-01	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
EEE	[MJ]	2,43E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	7,30E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Caption	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						
	The numbers are declared in scientific notation, e.g. 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 0,0000000000112.						

Table 5 – Biogenic carbon content at factory gate

BIOGENIC CARBON CONTENT PER KG OF STEEL PROFILE 1a, 2a, 3a-c, 4a-f		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0,00E+00
Biogenic carbon content in accompanying packaging	[kg C]	4,94E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

Additional information

LCA interpretation

The result is dominated by the supply of the hot-dip galvanised steel coil, which accounts for 91,2% of the total global warming potential of modules A1 to C4. Manufacturing at the production site contributes 5,8% and transport of the coil to the manufacturer 0,7%; the manufacturing contribution is modest because the operation is mechanical rather than thermal and the electricity consumed is drawn from the Danish grid. The end-of-life modules together contribute 2,3%, of which deconstruction is 1,2%, transport to waste treatment 0,2% and waste processing 0,9%; disposal to landfill is below 0,1%.

Technical information on scenarios

Transport to the building site (A4)

N.D.

Installation of the product in the building (A5)

N.D.

Reference service life

60 years, as provided by the manufacturer based on EN ISO 9224 providing reference service life values depending on the use condition and corrosion resistance from the thickness of the applied coating. The profiles (1a, 2a, 3a-c) for interior walls and ceilings are applied inside gypsum constructions, corrosivity category C1-C2. The heavier grades (4a-f) are used in external walls and light weight steel beams, corrosivity category C2-C3. The reference service life is stated for information only, as the use stage is not declared. These values are supported by values for lifetimes of stainless steel in inner and outer wall building constructions in Builds lifetime tables 2021.

The stated RSLs represent the manufacturer's assessment under defined reference conditions. They apply to profiles enclosed in dry, protected wall and surface-mounted ceiling constructions, installed in accordance with the applicable Knauf system instructions, excluding basement constructions and direct outdoor exposure. The assessment assumes that the building envelope and moisture protection are maintained and that harmful water ingress and persistent condensation are prevented. No routine maintenance of the concealed profiles is assumed. The values apply only under these conditions and do not constitute unconditional guarantees for all applications.

Use (B1-B7)

N.D.

End of life (C1-C4)

The end-of-life rates applied are 93% recycling, 6,5% incineration and 0,5% landfill of the steel and zinc fraction, which constitutes 100% of the declared product.

Scenario information	Value	Unit
Collected separately	1	kg
Collected with mixed waste	0	kg
For reuse	0	kg
For recycling	0,930	kg
For Incineration	0,065	kg
For final disposal	0,005	kg

Re-use, recovery and recycling potential (D)

The net steel scrap credited beyond the system boundary is the scrap recovered at end of life, subtracted by the scrap input from previous product life cycles declared by the coil suppliers, at the 93% recycling rate applied to the steel and zinc fraction of the declared unit. This amounts to 0,83kg per declared unit. No energy is recovered from the incinerated fraction of steel.

Scenario information/Material	Value	Unit
Net steel scrap credited	0,83	kg
Energy recovery from waste incineration	0	MJ

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+A2 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+A2 chapter 7.4.2.

References

Publisher	 www.epddanmark.dk Template version 2025.1
Programme operator	Danish Technological Institute Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	 Daniel Gelardi Berman daniel@atdawn.ai +45 42 50 28 82 www.atdawn.ai
LCA software / background data	Dawn (www.atdawn.ai) Formerly known as Sustainly Ecoinvent 3.12, EN 15804+A2 system model EN 15804 reference package EF 3.1
3rd party verifier	LCA Specialists Mirko Miseljic +45 23 48 83 78 lcaspecialists@outlook.com Verified according to Verification Checklist 1 v2.9.1.

General programme instructions

version 3.0, April 2025

www.epddanmark.dk

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