epddanmark

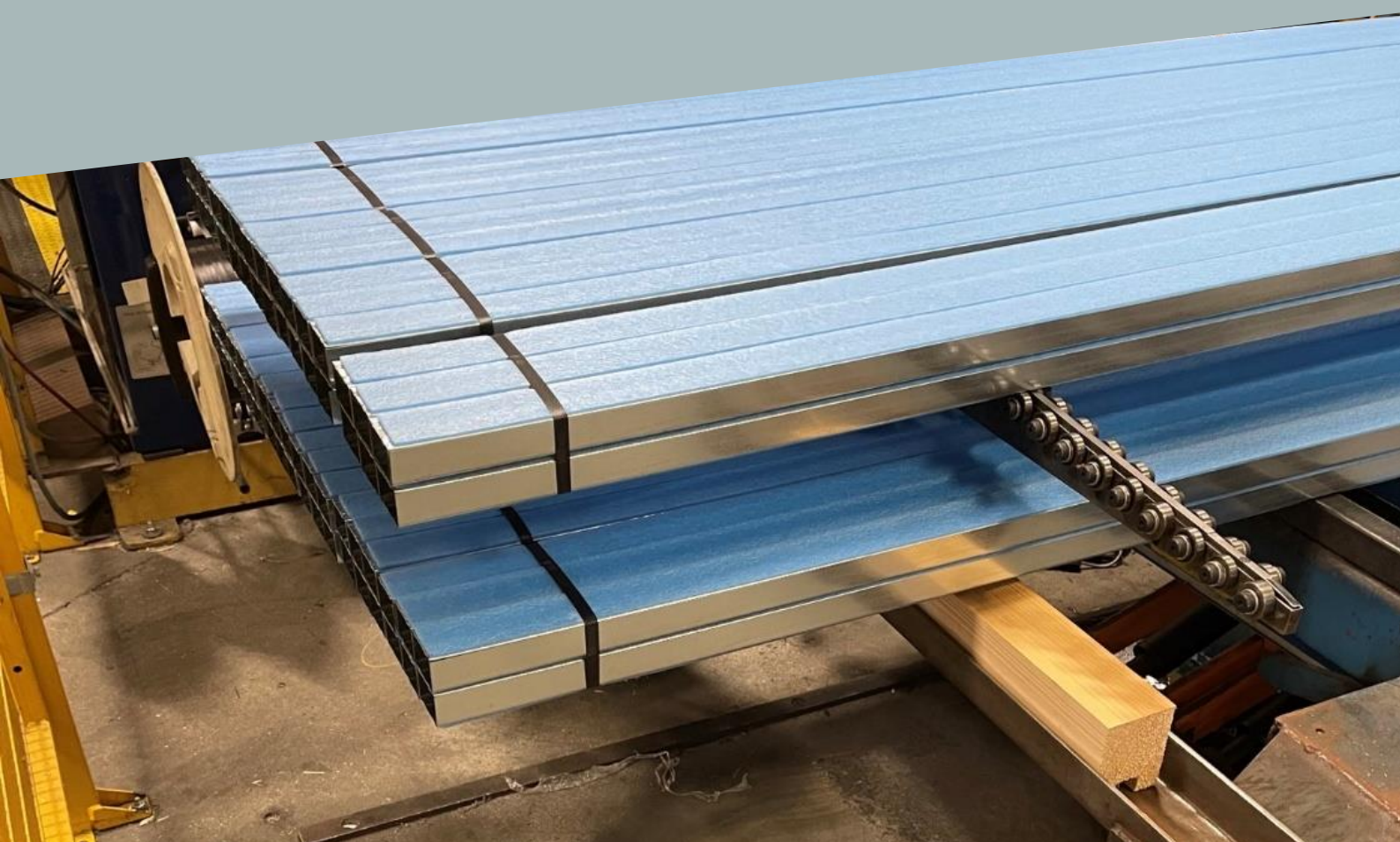
ECO PLATFORM EPD VERIFIED

Owner: Knauf A/S
No.: MD-22014-EN
Issued: 25-02-2022
Valid to: 25-02-2027

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**



Owner of declaration

Knauf A/S
Kløvermarksvej 6
DK-9500 Hobro

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
Light gauge steel profiles with foam.

Production site
Ib Andresen Industri A/S
Industrivej 12-20
DK-5550 Langeskov

Product(s) use
The profiles are used for the mounting of sheet materials in the construction of interior walls and ceilings.

Declared or functional unit
1 kg of light gauge steel profile with foam.

Year of data
2019-2020

Issued: 25-02-2022
Valid to: 25-02-2027

Basis of calculation
This EPD is developed in accordance with the European standard EN 15804+A2.

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:

Ninkie Bendtsen

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-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	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Product information

Product description

Steel profiles are manufactured from hot dip galvanized steel with different surface treatment in order to obtain intact surface on the products. To meet requirements regarding noise reduction properties, the profiles are mounted with sealing strips and isolation sheets.

The products are transported to the customers on wooden spacers with plastic straps. The straps are not included in the EPD.

The main product compounds incl. wood packaging.

Profile width	Steel weight %	Zinc weight %	Glue weight %	Foam weight %
45 mm	95,48	2,75	0,38	1,38
70 mm	95,20	2,74	0,31	1,74
95 mm	95,04	2,74	0,26	1,97
120 mm	94,91	2,73	0,22	2,13
145 mm	95,18	2,74	0,20	1,88
160 mm	95,32	2,75	0,18	1,75
Packaging				
Pallets and sawn wood	3.34E-04		Kg	

Content in the product pr. declared unit

Included products

Roll formed profiles produced from steel quality S250GD + Z100 steel thickness 0,46 mm

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of ***light gauge steel profiles with foam*** on the Ib Andresen Industri production site located in Langeskov, Fyn. Product specific data are based on average values collected in the period 1/7 2019 - 30/6 2020 and provided by Ib Andresen Industry. Background data are based on Simapro version 9.2.0.2 2020 and Ecoinvent 3.6 2019 – allocation, cut-off by classification – unit.

Hazardous substances

The profiles does not contain substances listed in the ”Candidate List of Substances of Very High Concern for authorization”.

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

Essential characteristics (CE)

The Knauf-profiles are covered by harmonised technical specification EN 10346:2015. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations.

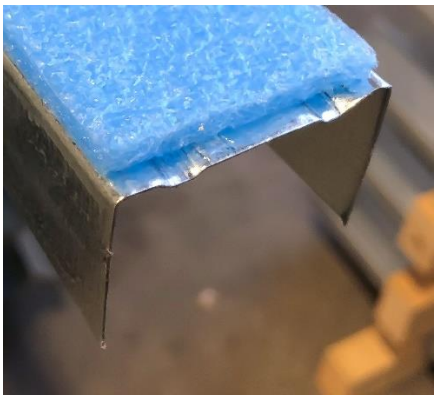
Further technical information can be obtained by contacting the manufacturer or on the website:

https://www.knauf.dk

Reference Service Life (RSL)

Not declared.

Picture of product(s)



The profiles are available with different types of surface treatment. This profile for use in internal walls and ceilings havs a surface layer of 100 g per square meter.

Steel grades are expressed according to the standard EN 10027, where S 250 GD + Z100 designates a structural steel (S) with a specified yield of strength of 250 MPa (250) and a surface layer of 100 g plain Zinc per square meter (Z100).

	Profile
Steel grade	S250GD+Z100
Product objectives	Material of 0,46 mm thickness for use in steel profiles for interior walls and ceilings.
Steel	
Manufactured in accordance with European standard	EN 10346:2015
Iron weight (w-%)	97,2
Carbon weight (w-%)	0,2
Silicon weight (w-%)	0,6
Manganese weight (w-%)	1,7
Phosphorus weight (w-%)	0,1
Sulfur weight (w-%)	0,045
Titan weight (w-%)	-
Coating	
Coating	Hot galvanized
Coating thickness per side ($\mu m/m^2$)	7
Coating total weight (g/m^2)	100
Zink weight (w-%)	2,8
Corrosion class	C1 – C2

LCA background

Declared unit

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

Name	Value	Unit
Declared unit	1	kg
Conversion factor to 1 kg.	1	-

Functional Unit

Not defined.

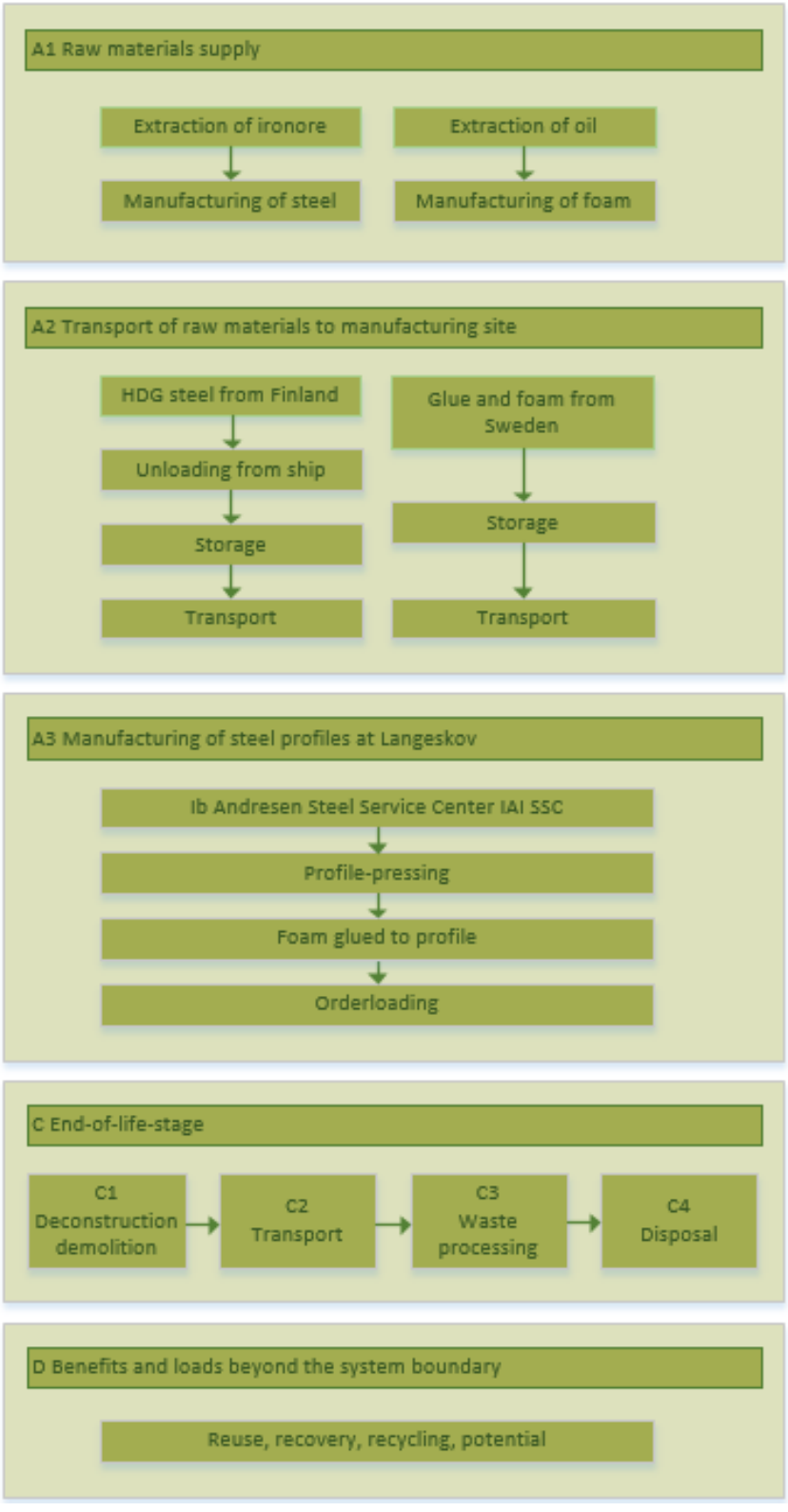
PCR

Product category rules: PRC 2019:14 Construction products, Version 1.0, date 2019-12-20.

This EPD is developed according to the core rules for the product category of construction products in EN 15804:2012+A2.

System diagram

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



The profiles are manufactured from hot dip galvanized carbon steel delivered from steelworks as coils by boat to the IAI's port in Nyborg. In IAI site Langeskov, the coil is divided in narrow bands whose width fit the specific profiles, and the profiles are manufactured through roll forming technique. Sheets of insolation foam is glued to the profiles.

System boundary

The general rules for the exclusion of inputs and outputs follow 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.

The system boundaries of this EPD includes Module A1, A2, A3, C1, C2, C3, C4 and Module D.

Product stage (A1-A3) includes:
A1: Extraction and processing of raw materials. The mining of raw materials as iron and zinc. The process of making the hot rolled steel-coils in the right alloy accordingly the IAI-requirement, including zinc-coating. Production of glue: hot melt adhesive, and foam: HCFC-free expanded polyethylene.

A2: Transport of raw material from the steel mill in Finland and of the glue and foam from Sweden to the IAI stock and manufacturing site. Transport of the profiles to stock in Hobro.

A3: The manufacturing processes. Slitting of hot rolled coils and roll forming steel into various widths, thicknesses and surface treatments according to the requirements of the ordered profiles. Applying of glue and mounting of foam.

Packaging to customers on pallets with straps.

External services such as electricity, heating and water, waste and emissions to air, land and water from manufacturing.

End of life stage (C1-C4) includes:
C1: Deconstruction of the construction into which the steel is built.

C2: Transportation of waste from construction-sites to waste processing sites / disposals.

C3: Waste processing, sorting of scrap steel and incineration of polyethylene

C4: Disposal.

Steel is a highly recyclable building material, once steel has been made, it can be recycled without weakening its properties.

The background data used is Miljøstyrelsens Affaldsstatistik 2018: Proportion of construction waste prepared for the purpose of reuse, recycled or used for other final material recovery is calculated at 89%.

The foam is sorted to incineration. The energy recovery from incineration is declared in D.

The impacts from the End-of-life stages were modelled in Simapro.

Resource recovery stage (D): Potential for reuse, recycling or energy recovery.

For the primary part of the steel 46 % is replacing primary steel by recycling. The secondary part of the steel is not credited to avoid double counting.

Energy recovery by incineration of plastic is replacing danish electricity and district heating.

LCA results

Environmental performance for Steel 2a: S250GD+Z100, t=0.46 mm, b=45 mm

Potential environmental impact per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	1.86E+00	5.41E-02	1.44E-02	2.16E-03	4.51E-03	7.64E-02	1.39E-07	-1.07E+00
GWP-fossil	[kg CO_2 eq.]	1.85E+00	5.41E-02	1.32E-02	2.16E-03	4.51E-03	7.78E-02	1.39E-07	-1.07E+00
GWP-biogenic	[kg CO_2 eq.]	5.99E-03	1.69E-05	1.21E-03	6.01E-07	3.30E-06	-1.39E-03*	2.76E-10	6.04E-04
GWP-luluc	[kg CO_2 eq.]	1.27E-03	2.34E-05	1.56E-05	1.70E-07	1.33E-06	2.72E-05	3.88E-11	-4.06E-04
ODP	[kg CFC 11 eq.]	1.23E-07	1.20E-08	4.18E-10	4.67E-10	1.07E-09	3.53E-09	5.73E-14	-4.83E-08
AP	[mol H^+ eq.]	2.29E-02	5.86E-04	4.39E-05	2.26E-05	2.30E-05	3.01E-04	1.32E-09	-5.37E-03
EP-freshwater	[kg PO_4 eq.]	1.32E-03	3.95E-06	7.98E-06	7.76E-08	3.22E-07	2.06E-05	1.43E-11	-7.98E-04
EP-marine	[kg N eq.]	2.42E-03	1.56E-04	9.75E-06	1.00E-05	7.87E-06	7.01E-05	4.57E-10	-1.12E-03
EP-terrestrial	[mol N eq.]	8.08E-02	1.72E-03	1.13E-04	1.10E-04	8.62E-05	7.88E-04	5.01E-09	-1.19E-02
POCP	[kg NMVOC eq.]	8.99E-03	4.80E-04	2.40E-05	3.01E-05	2.57E-05	2.14E-04	1.45E-09	-5.18E-03
ADPm[1]	[kg Sb eq.]	2.16E-03	8.16E-07	5.07E-08	3.32E-09	7.75E-08	1.35E-06	1.27E-12	-1.90E-05
ADPf[1]	[MJ]	2.28E+01	7.99E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.89E-06	-1.06E+01
WDP[1]	[m^3]	8.00E-01	2.60E-03	2.09E-03	3.99E-05	2.30E-04	3.48E-03	1.74E-07	-1.88E-01

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 use

*: the negative value is from the waste processing of the Iron Scrap.

Use of resources per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	[MJ]	2.19E+00	8.13E-03	1.31E-01	1.61E-04	8.91E-04	5.28E-02	3.15E-08	-1.20E+00
PERM	[MJ]	0.00E+00	0.00E+00	7.43E-03*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.19E+00	8.13E-03	1.31E-01	1.61E-04	8.91E-04	5.28E-02	3.15E-08	-1.20E+00
PENRE	[MJ]	2.28E+01	7.99E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.89E-06	-1.06E+01
PENRM	[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
PENRT	[MJ]	2.28E+01	7.99E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.89E-06	-1.06E+01
SM	[kg]	4.11E-01	0.00E+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
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
FW	[m^3]	2.27E-02	8.74E-05	4.84E-04	1.53E-06	8.05E-06	1.64E-04	4.15E-09	-6.64E-03

PERE = Renewable primary energy resources used as energy carrier; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Non-renewable primary energy resources used as energy carrier; 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

*from wood packaging

Additional environmental impact per declared unit (ND = not declared)

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	[Disease incidence]	2.46E-07	4.16E-09	2.59E-10	5.98E-10	4.19E-10	3.74E-09	2.56E-14	-9.08E-08
IRP[2]	[kBq U235 eq.]	1.69E-01	3.76E-03	1.74E-03	1.35E-04	3.60E-04	3.47E-03	1.74E-08	-4.07E-02
ETP-fw[1]	[CTUe]	9.26E+01	6.55E-01	2.35E-01	1.79E-02	5.63E-02	1.46E+00	2.52E-06	-5.36E+01
HTP-c[1]	[CTUh]	1.57E-08	2.10E-11	3.58E-12	6.27E-13	1.39E-12	3.71E-11	5.83E-17	-8.76E-09
HTP-nc[1]	[CTUh]	1.94E-07	6.71E-10	1.36E-10	1.54E-11	6.40E-11	1.75E-09	1.79E-15	-3.71E-08
SQP[1]	-	ND	ND	ND	ND	ND	ND	ND	ND

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater. total; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)

Waste production and output flows per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	[kg]	3.75E-04	1.71E-06	7.69E-08	8.10E-08	1.71E-07	1.07E-06	5.81E-12	-7.41E-05
NHWD	[kg]	6.80E-01	5.51E-02	6.95E-03	3.52E-05	6.15E-03	1.03E-02	2.64E-05	9.67E-03
RWD	[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
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
MFR	[kg]	0.00E+00	0.00E+00	5.91E-06	0.00E+00	0.00E+00	9.82E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	9.22E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.61E-01	0.00E+00	0.00E+00

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; EE = Exported energy)

Environmental performance for Steel 2a: S250GD+Z100, t=0.46 mm, b=70 mm

Potential environmental impact per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	1.87E+00	5.41E-02	1.44E-02	2.16E-03	4.51E-03	8.48E-02	1.39E-07	-1.07E+00
GWP-fossil	[kg CO_2 eq.]	1.86E+00	5.40E-02	1.32E-02	2.16E-03	4.51E-03	8.61E-02	1.39E-07	-1.07E+00
GWP-biogenic	[kg CO_2 eq.]	6,03E-03	1,69E-05	1,21E-03	6,01E-07	3,30E-06	-1,38E-03*	2,75E-10	5,46E-04
GWP-luluc	[kg CO_2 eq.]	1.28E-03	2.34E-05	1.56E-05	1.70E-07	1.33E-06	2.72E-05	3.87E-11	-4.07E-04
ODP	[kg CFC 11 eq.]	1.23E-07	1.20E-08	4.18E-10	4.67E-10	1.07E-09	3.53E-09	5.71E-14	-4.82E-08
AP	[mol H^+ eq.]	2.29E-02	5.85E-04	4.39E-05	2.26E-05	2.30E-05	3.01E-04	1.32E-09	-5.37E-03
EP-freshwater	[kg P eq.]	1.32E-03	3.95E-06	7.98E-06	7.76E-08	3.22E-07	2.06E-05	1.42E-11	-7.98E-04
EP-marine	[kg N eq.]	2.42E-03	1.55E-04	9.75E-06	1.00E-05	7.87E-06	7.05E-05	4.56E-10	-1.12E-03
EP-terrestrial	[mol N eq.]	8.06E-02	1.72E-03	1.13E-04	1.10E-04	8.62E-05	7.91E-04	4.99E-09	-1.19E-02
POCP	[kg NMVOC eq.]	9.04E-03	4.79E-04	2.40E-05	3.01E-05	2.57E-05	2.15E-04	1.45E-09	-5.17E-03
ADPm[1]	[kg Sb eq.]	2.15E-03	8.15E-07	5.07E-08	3.32E-09	7.75E-08	1.35E-06	1.27E-12	-1.90E-05
ADPf[1]	[MJ]	2.30E+01	7.98E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.88E-06	-1.07E+01
WDP[1]	[m^3]	8.03E-01	2.60E-03	2.09E-03	3.99E-05	2.30E-04	3.48E-03	1.74E-07	-1.89E-01

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 use

*: the negative value is from the waste processing of the Iron Scrap.

Use of resources per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	[MJ]	2.19E+00	8.12E-03	1.31E-01	1.61E-04	8.91E-04	5.27E-02	3.14E-08	-1.21E+00
PERM	[MJ]	0.00E+00	0.00E+00	7.43E-03*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.19E+00	8.12E-03	1.31E-01	1.61E-04	8.91E-04	5.27E-02	3.14E-08	-1.21E+00
PENRE	[MJ]	2.30E+01	7.98E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.88E-06	-1.07E+01
PENRM	[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
PENRT	[MJ]	2.30E+01	7.98E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.88E-06	-1.07E+01
SM	[kg]	4.09E-01	0.00E+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
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
FW	[m^3]	2.27E-02	8.72E-05	4.84E-04	1.53E-06	8.05E-06	1.65E-04	4.14E-09	-6.83E-03

PERE = Renewable primary energy resources used as energy carrier; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Non-renewable primary energy resources used as energy carrier; 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

*from wood packaging

Additional environmental impact per declared unit (ND = not declared)

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	[Disease incidence]	2.45E-07	4.16E-09	2.59E-10	5.98E-10	4.19E-10	3.74E-09	2.56E-14	-9.06E-08
IRP[2]	[kBq U235 eq.]	1.69E-01	3.76E-03	1.74E-03	1.35E-04	3.60E-04	3.46E-03	1.73E-08	-4.08E-02
ETP-fw[1]	[CTUe]	9.24E+01	6.54E-01	2.35E-01	1.79E-02	5.63E-02	1.45E+00	2.52E-06	-5.35E+01
HTP-c[1]	[CTUh]	1.57E-08	2.10E-11	3.58E-12	6.27E-13	1.39E-12	3.72E-11	5.82E-17	-8.73E-09
HTP-nc[1]	[CTUh]	1.94E-07	6.71E-10	1.36E-10	1.54E-11	6.40E-11	1.75E-09	1.79E-15	-3.70E-08
SQP[1]	-	ND	ND	ND	ND	ND	ND	ND	ND

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater. total; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)

Waste production and output flows per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	[kg]	3.74E-04	1.71E-06	7.69E-08	8.10E-08	1.71E-07	1.07E-06	5.80E-12	-7.39E-05
NHWD	[kg]	6.79E-01	5.50E-02	6.95E-03	3.52E-05	6.15E-03	1.04E-02	2.63E-05	9.47E-03
RWD	[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
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
MFR	[kg]	0.00E+00	0.00E+00	5.91E-06	0.00E+00	0.00E+00	9.80E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	9.22E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.50E-01	0.00E+00	0.00E+00

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; EE = Exported energy)

Environmental performance for Steel 2a: S250GD+Z100, t=0.46 mm, b=95 mm

Potential environmental impact per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	1.87E+00	5.40E-02	1.44E-02	2.16E-03	4.51E-03	8.99E-02	1.39E-07	-1.07E+00
GWP-fossil	[kg CO_2 eq.]	1.86E+00	5.40E-02	1.32E-02	2.16E-03	4.51E-03	9.12E-02	1.38E-07	-1.07E+00
GWP-biogenic	[kg CO_2 eq.]	6.07E-03	1.69E-05	1.21E-03	6.01E-07	3.30E-06	-1.38E-03*	2.75E-10	5.11E-04
GWP-luluc	[kg CO_2 eq.]	1.28E-03	2.34E-05	1.56E-05	1.70E-07	1.33E-06	2.71E-05	3.86E-11	-4.08E-04
ODP	[kg CFC 11 eq.]	1.23E-07	1.20E-08	4.18E-10	4.67E-10	1.07E-09	3.53E-09	5.70E-14	-4.82E-08
AP	[mol H^+ eq.]	2.29E-02	5.84E-04	4.39E-05	2.26E-05	2.30E-05	3.01E-04	1.32E-09	-5.37E-03
EP-freshwater	[kg P eq.]	1.32E-03	3.94E-06	7.98E-06	7.76E-08	3.22E-07	2.06E-05	1.42E-11	-7.99E-04
EP-marine	[kg N eq.]	2.43E-03	1.55E-04	9.75E-06	1.00E-05	7.87E-06	7.07E-05	4.55E-10	-1.12E-03
EP-terrestrial	[mol N eq.]	8.06E-02	1.71E-03	1.13E-04	1.10E-04	8.62E-05	7.93E-04	4.99E-09	-1.19E-02
POCP	[kg NMVOC eq.]	9.08E-03	4.79E-04	2.40E-05	3.01E-05	2.57E-05	2.15E-04	1.45E-09	-5.17E-03
ADPm[1]	[kg Sb eq.]	2.15E-03	8.14E-07	5.07E-08	3.32E-09	7.75E-08	1.35E-06	1.27E-12	-1.89E-05
ADPf[1]	[MJ]	2.32E+01	7.97E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.87E-06	-1.07E+01
WDP[1]	[m^3]	8,06E-01	2,60E-03	2,09E-03	3,99E-05	2,30E-04	3,48E-03	1,74E-07	-1,89E-01

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 use

*: the negative value is from the waste processing of the Iron Scrap.

Use of resources per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	[MJ]	2.20E+00	8.11E-03	1.31E-01	1.61E-04	8.91E-04	5.26E-02	3.13E-08	-1.22E+00
PERM	[MJ]	0.00E+00	0.00E+00	7.43E-03*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.20E+00	8.11E-03	1.31E-01	1.61E-04	8.91E-04	5.26E-02	3.13E-08	-1.22E+00
PENRE	[MJ]	2.32E+01	7.97E-01	1.52E-01	2.98E-02	7.06E-02	3.40E-01	3.87E-06	-1.07E+01
PENRM	[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
PENRT	[MJ]	2.32E+01	7.97E-01	1.52E-01	2.98E-02	7.06E-02	3.40E-01	3.87E-06	-1.07E+01
SM	[kg]	4.09E-01	0.00E+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
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
FW	[m^3]	2.28E-02	8.72E-05	4.84E-04	1.53E-06	8.05E-06	1.65E-04	4.14E-09	-6.94E-03

PERE = Renewable primary energy resources used as energy carrier; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Non-renewable primary energy resources used as energy carrier; 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

*from wood packaging

Additional environmental impact per declared unit (ND = not declared)

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	[Disease incidence]	2.45E-07	4.15E-09	2.59E-10	5.98E-10	4.19E-10	3.73E-09	2.55E-14	-9.04E-08
IRP[2]	[kBq U235 eq.]	1.70E-01	3.75E-03	1.74E-03	1.35E-04	3.60E-04	3.46E-03	1.73E-08	-4.09E-02
ETP-fw[1]	[CTUe]	9.24E+01	6.53E-01	2.35E-01	1.79E-02	5.63E-02	1.45E+00	2.51E-06	-5.35E+01
HTP-c[1]	[CTUh]	1.57E-08	2.10E-11	3.58E-12	6.27E-13	1.39E-12	3.74E-11	5.81E-17	-8.72E-09
HTP-nc[1]	[CTUh]	1.93E-07	6.70E-10	1.36E-10	1.54E-11	6.40E-11	1.76E-09	1.79E-15	-3.70E-08
SQP[1]	-	ND	ND	ND	ND	ND	ND	ND	ND

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater. total; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)

Waste production and output flows per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	[kg]	3.74E-04	1.71E-06	7.69E-08	8.10E-08	1.71E-07	1.08E-06	5.79E-12	-7.38E-05
NHWD	[kg]	6.78E-01	5.50E-02	6.95E-03	3.52E-05	6.15E-03	1.04E-02	2.63E-05	9.35E-03
RWD	[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
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
MFR	[kg]	0.00E+00	0.00E+00	5.91E-06	0.00E+00	0.00E+00	9.78E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	9.22E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.04E-01	0.00E+00	0.00E+00

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; EE = Exported energy)

Environmental performance for Steel 2a: S250GD+Z100, t=0.46 mm, b=120 mm

Potential environmental impact per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	1.87E+00	5.40E-02	1.44E-02	2.16E-03	4.51E-03	9.41E-02	1.39E-07	-1.07E+00
GWP-fossil	[kg CO_2 eq.]	1.86E+00	5.39E-02	1.32E-02	2.16E-03	4.51E-03	9.54E-02	1.38E-07	-1.07E+00
GWP-biogenic	[kg CO_2 eq.]	6.08E-03	1.69E-05	1.21E-03	6.01E-07	3.30E-06	-1.38E-03*	2.74E-10	4.82E-04
GWP-luluc	[kg CO_2 eq.]	1.28E-03	2.33E-05	1.56E-05	1.70E-07	1.33E-06	2.71E-05	3.86E-11	-4.09E-04
ODP	[kg CFC 11 eq.]	1.23E-07	1.19E-08	4.18E-10	4.67E-10	1.07E-09	3.52E-09	5.70E-14	-4.82E-08
AP	[mol H^+ eq.]	2.28E-02	5.83E-04	4.39E-05	2.26E-05	2.30E-05	3.02E-04	1.31E-09	-5.37E-03
EP-freshwater	[kg P eq.]	1.32E-03	3.94E-06	7.98E-06	7.76E-08	3.22E-07	2.05E-05	1.42E-11	-7.99E-04
EP-marine	[kg N eq.]	2.43E-03	1.55E-04	9.75E-06	1.00E-05	7.87E-06	7.09E-05	4.54E-10	-1.12E-03
EP-terrestrial	[mol N eq.]	8.04E-02	1.71E-03	1.13E-04	1.10E-04	8.62E-05	7.95E-04	4.98E-09	-1.19E-02
POCP	[kg NMVOC eq.]	9.10E-03	4.78E-04	2.40E-05	3.01E-05	2.57E-05	2.16E-04	1.45E-09	-5.17E-03
ADPm[1]	[kg Sb eq.]	2.14E-03	8.14E-07	5.07E-08	3.32E-09	7.75E-08	1.35E-06	1.27E-12	-1.89E-05
ADPf[1]	[MJ]	2.33E+01	7.97E-01	1.52E-01	2.98E-02	7.06E-02	3.40E-01	3.87E-06	-1.07E+01
WDP[1]	[m^3]	8.07E-01	2.60E-03	2.09E-03	3.99E-05	2.30E-04	3.49E-03	1.73E-07	-1.89E-01

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 use

*: the negative value is from the waste processing of the Iron Scrap.

Table 5.2.4b Use of resources per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	[MJ]	2.20E+00	8.11E-03	1.31E-01	1.61E-04	8.91E-04	5.25E-02	3.13E-08	-1.23E+00
PERM	[MJ]	0.00E+00	0.00E+00	7.43E-03*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.20E+00	8.11E-03	1.31E-01	1.61E-04	8.91E-04	5.25E-02	3.13E-08	-1.23E+00
PENRE	[MJ]	2.33E+01	7.97E-01	1.52E-01	2.98E-02	7.06E-02	3.40E-01	3.87E-06	-1.07E+01
PENRM	[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
PENRT	[MJ]	2.33E+01	7.97E-01	1.52E-01	2.98E-02	7.06E-02	3.40E-01	3.87E-06	-1.07E+01
SM	[kg]	4.08E-01	0.00E+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
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
FW	[m^3]	2.28E-02	8.71E-05	4.84E-04	1.53E-06	8.05E-06	1.65E-04	4.13E-09	-7.04E-03

PERE = Renewable primary energy resources used as energy carrier; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Non-renewable primary energy resources used as energy carrier; 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

*from wood packaging

Table 5.2.4c Additional environmental impact per declared unit (ND = not declared)

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	[Disease incidence]	2.45E-07	4.15E-09	2.59E-10	5.98E-10	4.19E-10	3.73E-09	2.55E-14	-9.03E-08
IRP[2]	[kBq U235 eq.]	1.70E-01	3.75E-03	1.74E-03	1.35E-04	3.60E-04	3.45E-03	1.73E-08	-4.10E-02
ETP-fw[1]	[CTUe]	9.23E+01	6.53E-01	2.35E-01	1.79E-02	5.63E-02	1.45E+00	2.51E-06	-5.34E+01
HTP-c[1]	[CTUh]	1.56E-08	2.09E-11	3.58E-12	6.27E-13	1.39E-12	3.75E-11	5.80E-17	-8.71E-09
HTP-nc[1]	[CTUh]	1.93E-07	6.69E-10	1.36E-10	1.54E-11	6.40E-11	1.76E-09	1.78E-15	-3.70E-08
SQP[1]	-	ND	ND	ND	ND	ND	ND	ND	ND

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater. total; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)

Table 5.2.4d Waste production and output flows per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	[kg]	3.73E-04	1.71E-06	7.69E-08	8.10E-08	1.71E-07	1.08E-06	5.78E-12	-7.37E-05
NHWD	[kg]	6.78E-01	5.49E-02	6.95E-03	3.52E-05	6.15E-03	1.04E-02	2.63E-05	9.25E-03
RWD	[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
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
MFR	[kg]	0.00E+00	0.00E+00	5.91E-06	0.00E+00	0.00E+00	9.76E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	9.22E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.49E-01	0.00E+00	0.00E+00

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; EE = Exported energy)

Environmental performance for Steel 2a: S250GD+Z100, t=0.46 mm, b=145 mm

Potential environmental impact per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	1.87E+00	5.40E-02	1.44E-02	2.16E-03	4.51E-03	8.54E-02	1.39E-07	-1.07E+00
GWP-fossil	[kg CO_2 eq.]	1.86E+00	5.40E-02	1.32E-02	2.16E-03	4.51E-03	8.67E-02	1.39E-07	-1.07E+00
GWP-biogenic	[kg CO_2 eq.]	6.05E-03	1.69E-05	1.21E-03	6.01E-07	3.30E-06	-1.38E-03*	2.75E-10	5.42E-04
GWP-luluc	[kg CO_2 eq.]	1.28E-03	2.34E-05	1.56E-05	1.70E-07	1.33E-06	2.72E-05	3.87E-11	-4.07E-04
ODP	[kg CFC 11 eq.]	1.23E-07	1.20E-08	4.18E-10	4.67E-10	1.07E-09	3.53E-09	5.71E-14	-4.82E-08
AP	[mol H^+ eq.]	2.29E-02	5.85E-04	4.39E-05	2.26E-05	2.30E-05	3.01E-04	1.32E-09	-5.37E-03
EP-freshwater	[kg P eq.]	1.32E-03	3.95E-06	7.98E-06	7.76E-08	3.22E-07	2.06E-05	1.42E-11	-7.98E-04
EP-marine	[kg N eq.]	2.43E-03	1.55E-04	9.75E-06	1.00E-05	7.87E-06	7.05E-05	4.55E-10	-1.12E-03
EP-terrestrial	[mol N eq.]	8.06E-02	1.72E-03	1.13E-04	1.10E-04	8.62E-05	7.92E-04	4.99E-09	-1.19E-02
POCP	[kg NMVOC eq.]	9.06E-03	4.79E-04	2.40E-05	3.01E-05	2.57E-05	2.15E-04	1.45E-09	-5.17E-03
ADPm[1]	[kg Sb eq.]	2.15E-03	8.14E-07	5.07E-08	3.32E-09	7.75E-08	1.35E-06	1.27E-12	-1.90E-05
ADPf[1]	[MJ]	2.31E+01	7.97E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.88E-06	-1.07E+01
WDP[1]	[m^3]	8.04E-01	2.60E-03	2.09E-03	3.99E-05	2.30E-04	3.48E-03	1.74E-07	-1.89E-01

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 use

*: the negative value is from the waste processing of the Iron Scrap.

Use of resources per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	[MJ]	2.20E+00	8.12E-03	1.31E-01	1.61E-04	8.91E-04	5.27E-02	3.14E-08	-1.21E+00
PERM	[MJ]	0.00E+00	0.00E+00	7.43E-03*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.20E+00	8.12E-03	1.31E-01	1.61E-04	8.91E-04	5.27E-02	3.14E-08	-1.21E+00
PENRE	[MJ]	2.31E+01	7.97E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.88E-06	-1.07E+01
PENRM	[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
PENRT	[MJ]	2.31E+01	7.97E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.88E-06	-1.07E+01
SM	[kg]	4.93E-01	0.00E+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
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
FW	[m^3]	2.28E-02	8.72E-05	4.84E-04	1.53E-06	8.05E-06	1.65E-04	4.14E-09	-6.84E-03

PERE = Renewable primary energy resources used as energy carrier; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Non-renewable primary energy resources used as energy carrier; 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

*from wood packaging

Additional environmental impact per declared unit (ND = not declared)

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	[Disease incidence]	2.45E-07	4.15E-09	2.59E-10	5.98E-10	4.19E-10	3.74E-09	2.56E-14	-9.05E-08
IRP[2]	[kBq U235 eq.]	1.70E-01	3.76E-03	1.74E-03	1.35E-04	3.60E-04	3.46E-03	1.73E-08	-4.08E-02
ETP-fw[1]	[CTUe]	9.24E+01	6.53E-01	2.35E-01	1.79E-02	5.63E-02	1.45E+00	2.52E-06	-5.35E+01
HTP-c[1]	[CTUh]	1.57E-08	2.10E-11	3.58E-12	6.27E-13	1.39E-12	3.73E-11	5.82E-17	-8.73E-09
HTP-nc[1]	[CTUh]	1.94E-07	6.70E-10	1.36E-10	1.54E-11	6.40E-11	1.75E-09	1.79E-15	-3.70E-08
SQP[1]	-	ND	ND	ND	ND	ND	ND	ND	ND

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater. total; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)

Waste production and output flows per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	[kg]	3.74E-04	1.71E-06	7.69E-08	8.10E-08	1.71E-07	1.07E-06	5.80E-12	-7.39E-05
NHWD	[kg]	6.79E-01	5.50E-02	6.95E-03	3.52E-05	6.15E-03	1.04E-02	2.63E-05	9.46E-03
RWD	[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
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
MFR	[kg]	0.00E+00	0.00E+00	5.91E-06	0.00E+00	0.00E+00	9.79E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	9.22E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.57E-01	0.00E+00	0.00E+00

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; EE = Exported energy)

Environmental performance for Steel 2a: S250GD+Z100, t=0.46 mm, b=160 mm

Potential environmental impact per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	1.87E+00	5.40E-02	1.44E-02	2.16E-03	4.51E-03	8.12E-02	1.39E-07	-1.07E+00
GWP-fossil	[kg CO_2 eq.]	1.86E+00	5.40E-02	1.32E-02	2.16E-03	4.51E-03	8.25E-02	1.39E-07	-1.07E+00
GWP-biogenic	[kg CO_2 eq.]	6.04E-03	1.69E-05	1.21E-03	6.01E-07	3.30E-06	-1.39E-03*	2.75E-10	5.71E-04
GWP-luluc	[kg CO_2 eq.]	1.28E-03	2.34E-05	1.56E-05	1.70E-07	1.33E-06	2.72E-05	3.87E-11	-4.07E-04
ODP	[kg CFC 11 eq.]	1.23E-07	1.20E-08	4.18E-10	4.67E-10	1.07E-09	3.53E-09	5.72E-14	-4.83E-08
AP	[mol H^+ eq.]	2.29E-02	5.85E-04	4.39E-05	2.26E-05	2.30E-05	3.01E-04	1.32E-09	-5.37E-03
EP-freshwater	[kg P eq.]	1.32E-03	3.95E-06	7.98E-06	7.76E-08	3.22E-07	2.06E-05	1.43E-11	-7.98E-04
EP-marine	[kg N eq.]	2.43E-03	1.55E-04	9.75E-06	1.00E-05	7.87E-06	7.03E-05	4.56E-10	-1.12E-03
EP-terrestrial	[mol N eq.]	8.08E-02	1.72E-03	1.13E-04	1.10E-04	8.62E-05	7.90E-04	5.00E-09	-1.19E-02
POCP	[kg NMVOC eq.]	9.05E-03	4.79E-04	2.40E-05	3.01E-05	2.57E-05	2.14E-04	1.45E-09	-5.17E-03
ADPm[1]	[kg Sb eq.]	2.16E-03	8.15E-07	5.07E-08	3.32E-09	7.75E-08	1.35E-06	1.27E-12	-1.90E-05
ADPf[1]	[MJ]	2.30E+01	7.98E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.88E-06	-1.07E+01
WDP[1]	[m^3]	8.03E-01	2.60E-03	2.09E-03	3.99E-05	2.30E-04	3.48E-03	1.74E-07	-1.88E-01

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 use

*: the negative value is from the waste processing of the Iron Scrap.

Use of resources per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	[MJ]	2.19E+00	8.12E-03	1.31E-01	1.61E-04	8.91E-04	5.27E-02	3.14E-08	-1.20E+00
PERM	[MJ]	0.00E+00	0.00E+00	7.43E-03*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.19E+00	8.12E-03	1.31E-01	1.61E-04	8.91E-04	5.27E-02	3.14E-08	-1.20E+00
PENRE	[MJ]	2.30E+01	7.98E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.88E-06	-1.07E+01
PENRM	[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
PENRT	[MJ]	2.30E+01	7.98E-01	1.52E-01	2.98E-02	7.06E-02	3.41E-01	3.88E-06	-1.07E+01
SM	[kg]	4.10E-01	0.00E+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
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
FW	[m^3]	2.27E-02	8.72E-05	4.84E-04	1.53E-06	8.05E-06	1.64E-04	4.15E-09	-6.75E-03

PERE = Renewable primary energy resources used as energy carrier; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Non-renewable primary energy resources used as energy carrier; 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

*from wood packaging

Additional environmental impact per declared unit (ND = not declared)

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	[Disease incidence]	2.46E-07	4.15E-09	2.59E-10	5.98E-10	4.19E-10	3.74E-09	2.56E-14	-9.06E-08
IRP[2]	[kBq U235 eq.]	1.69E-01	3.76E-03	1.74E-03	1.35E-04	3.60E-04	3.47E-03	1.74E-08	-4.08E-02
ETP-fw[1]	[CTUe]	9.25E+01	6.54E-01	2.35E-01	1.79E-02	5.63E-02	1.46E+00	2.52E-06	-5.35E+01
HTP-c[1]	[CTUh]	1.57E-08	2.10E-11	3.58E-12	6.27E-13	1.39E-12	3.72E-11	5.82E-17	-8.74E-09
HTP-nc[1]	[CTUh]	1.94E-07	6.70E-10	1.36E-10	1.54E-11	6.40E-11	1.75E-09	1.79E-15	-3.71E-08
SQP[1]	-	ND	ND	ND	ND	ND	ND	ND	ND

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater. total; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)

Waste production and output flows per declared unit

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	[kg]	3.75E-04	1.71E-06	7.69E-08	8.10E-08	1.71E-07	1.07E-06	5.80E-12	-7.40E-05
NHWD	[kg]	6.80E-01	5.50E-02	6.95E-03	3.52E-05	6.15E-03	1.03E-02	2.64E-05	9.56E-03
RWD	[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
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
MFR	[kg]	0.00E+00	0.00E+00	5.91E-06	0.00E+00	0.00E+00	9.81E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	9.22E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.12E-01	0.00E+00	0.00E+00

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; EE = Exported energy)

Biogenic carbon content per unit		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	1.5E-04
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

Technical information on scenarios

End of life (C1-C4) for all 6 profiles

Scenario information	45 mm	70 mm	95 mm	120 mm	145 mm	160 mm	Unit
Collected separately	-	-	-	-	-	-	kg
Collected with mixed waste	-	-	-	-	-	-	kg
For reuse	-	-	-	-	-	-	kg
For recycling	9.82E-01	9.80E-01	9.78E-01	9.76E-01	9.79E-01	9.81E-01	kg
For energy recovery	1.77E-02	2.05E-02	2.22E-02	2.36E-02	2.07E-02	1.93E-02	kg
For final disposal	-	-	-	-	-	-	kg
Assumptions for scenario development	-	-	-	-	-	-	As appropriate

Re-use, recovery and recycling potential (D) for all 6 profiles

Scenario information/Materiel	45 mm	70 mm	95 mm	120 mm	145 mm	160 mm	Unit
Recycling of primary steel	-4,52E-01	-4,51E-01	-4,50E-01	-4,49E-01	-4,50E-01	-4,51E-01	kg
Energy recovery by incineration of foam	1,77E-02	2,05E-02	2,00E-02	2,36E-02	2,07E-02	1,93E-02	kg

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonized test methods according to the provisions of the respective technical committees for European product standards are not available.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonized test methods according to the provisions of the respective technical committees for European product standards are not available.

References

Publisher	www.epddanmark.dk
Program operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Elisabeth Balle Herschend og Camilla Nørskov Flensted-Jensen Nørskov Miljø Egedal Centret 91A 3660 Stenløse ebh@norskov.dk
LCA software /background data	Simapro version 9.2.0.2 Ecoinvent 3.6 – allocation, cut-off by classification – unit.
3rd party verifier	Ninkie Bendtsen NIRAS A/S Sortemosevej 19 3450 Allerød

General program instructions
Version 2.0
www.epddanmark.dk

EN 15804
DS/EN 15804:2012 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

Product specific cPCR
Product category rules: PRC 2019:14 Construction products, Version 1.0, date 2019-12-20

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
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ISO 14044
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ISO 9224:2012
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