

# Annex for profiled sheets made of steel for roof, wall, deck and ceiling constructions

- Steel profile- trapezoidal profile 35/207
- Steel profile- standing seam profile 65/400
- Steel profile- liner tray 130/600
- 1kg steel profile

to the

## ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804+A2/

Owner of the Declaration	European Association for Profiles and Profiles e. V. (PPA-Europe)
Declaration number	Institut Bauen und Umwelt e.V. (IBU)
Issue date	19.07.2024
Valid to	18.07.2029

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## General Information

This document applies to steel - trapezoidal profile 35/207, standing seam profile, liner tray, 1kg steel profile as a public annex to the EPD-PPA-20240129-CBG1-EN document. The declared unit is 1 m<sup>2</sup> and 1kg. The LCA data were based on production data from the year 2022.

## General Information on Products

This annex contains the LCA results for:

- Steel trapezoidal profile 35/207
- Steel standing seam profile 65/400
- Steel liner tray profile 130/600
- 1kg steel profile

### Technical Data for Steel profile Trapezoidal 35/207

Technical specifications for profiled sheets are:

- EN 14782
- EN 508
- EN 1090

#### Constructional Data

Name	Value	Unit
Thickness of the sheet, according EN 10143	0.75	mm
Surface weight	6.65	kg/m <sup>2</sup>
Height of the profile, according EN 508 or EN 1090	35	mm

### Technical Data for Steel profile standing seam profile

Technical specifications for profiled sheets are:

- EN 14782
- EN 508
- EN 1090

### Constructional Data

Name	Value	Unit
Thickness of the sheet, according EN 10143	0.75	mm
Surface weight	7.2	kg/m <sup>2</sup>
Height of the profile, according EN 508 or EN 1090	65	mm

### Technical Data for Steel profile Liner tray

Technical specifications for profiled sheets are:

- EN 14782
- EN 508
- EN 1090

#### Constructional Data

Name	Value	Unit
Thickness of the sheet, according EN 10143	0.75	mm
Surface weight	9.42	kg/m <sup>2</sup>
Height of the profile, according EN 508 or EN 1090	130	mm

### Technical Data for 1kg steel sheet

- Steel sheet according to EN 10346: S280 GD to S350 GD with organic coating according to EN 10169

## 1. LCA: Calculation rules

### Declared unit

Product name	Name	Value	Unit
Trapezoidal 35/207	Declared unit	1	m <sup>2</sup>
	Surface weight of the profile (total value)	6.65	kg/m <sup>2</sup>
Standing seam profile	Declared unit	1	m <sup>2</sup>
	Surface weight of the profile (total value)	7,2	kg/m <sup>2</sup>
Liner tray	Declared unit	1	m <sup>2</sup>
	Surface weight of the profile (total value)	9.42	kg/m <sup>2</sup>
1kg Steel profile	Declared unit	1	kg

The annex includes the individual calculation for steel profiles, according to the declared unit mentioned above.

The last declaration, for 1kg steel profile, is calculated including all the modules. The individual calculation for the steel profile can further be utilized to estimate the LCA results for the products with different weight. The results for 1kg steel profile shall be scaled by the mass of the desired profile.

## 2. LCA: Scenarios and additional technical information

### Characteristic product properties of biogenic carbon

Information on describing the biogenic Carbon Content at factory gate

Product name	Name	Value	Unit
Trapezoidal 35/207	Biogenic carbon content in accompanying packaging	0,058	kg C

Standing seam profile	Biogenic carbon content in accompanying packaging	0,090	kg C
Liner tray	Biogenic carbon content in accompanying packaging	0,103	kg C
1kg Steel profile	Biogenic carbon content in accompanying packaging	0,012	kg C

The following technical information is a basis for the declared modules.

#### Transport to the building site (A4)

The transport to building site A4 is standardized and can be scaled up to building level. Hence, it is considered to be 100km.

Name	Value	Unit
Transport distance	100	km
Capacity utilisation (including empty runs)	61	%

#### Installation (A5)

The following packaging material is considered in A1- A3: polyethylene foil and wooden pallets  
A5 covers the waste treatment of packaging material at the point of installation. Disposal of transport packaging at the construction site and installation by construction machineries- diesel and electricity driven.  
Energy benefits resulting from the waste treatment of the packaging material is quantified in module D.

#### Installation into the building (A5)

Product name	Name	Value	Unit
Trapezoidal 35/207	Output substances following waste treatment on site	0.222	kg
Standing seam profile	Output substances following waste treatment on site	0.290	kg
Liner tray	Output substances following waste treatment on site	0.265	kg
1kg Steel profile	Output substances following waste treatment on site	0.040	kg

#### End of life (C1-C4)

Product name	Name	Value	Unit
Trapezoidal 35/207	Collected separately waste type	6.65	kg
	Recycling	6.65	kg
	Energy recovery	-	kg
	Landfilling	-	kg
Standing seam profile	Collected separately waste type	7.2	kg
	Recycling	7.2	kg
	Energy recovery	-	kg
	Landfilling	-	kg
Liner tray	Collected separately waste type	9.42	kg
	Recycling	9.42	kg
	Energy recovery	-	kg
	Landfilling	-	kg
1kg Steel profile	Collected separately waste type	1	kg
	Recycling	1	kg
	Energy recovery	-	kg
	Landfilling	-	kg

#### Reuse, recovery or recycling potential (D)

Resulting potential benefits and loads for the metal recycling are declared in module D.

### 3. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

#### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1m<sup>2</sup> Steel profile-Trapezoidal 35/207

Core Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> -Eq.]	1,84E+01	4,82E-02	4,94E-01	3,08E-01	2,41E-02	0,00E+00	0,00E+00	-1,34E+01
GWP-fossil	[kg CO <sub>2</sub> -Eq.]	1,84E+01	4,76E-02	2,79E-01	3,04E-01	2,38E-02	0,00E+00	0,00E+00	-1,34E+01
GWP-biogenic	[kg CO <sub>2</sub> -Eq.]	1,75E-02	1,41E-04	2,12E-01	1,21E-03	7,03E-05	0,00E+00	0,00E+00	2,60E-02
GWP-luluc	[kg CO <sub>2</sub> -Eq.]	7,14E-03	4,41E-04	2,37E-03	2,80E-03	2,21E-04	0,00E+00	0,00E+00	-5,54E-03
ODP	[kg CFC11-Eq.]	2,13E-10	6,20E-15	1,51E-11	6,13E-14	3,10E-15	0,00E+00	0,00E+00	3,88E-11
AP	[mol H <sup>+</sup> -Eq.]	4,43E-02	6,11E-05	1,55E-03	1,77E-03	3,06E-05	0,00E+00	0,00E+00	-3,01E-02
EP-freshwater	[kg P-Eq.]	9,55E-05	1,74E-07	9,54E-07	1,11E-06	8,71E-08	0,00E+00	0,00E+00	-1,03E-06
EP-marine	[kg N-Eq.]	1,12E-02	2,07E-05	7,45E-04	8,65E-04	1,04E-05	0,00E+00	0,00E+00	-7,24E-03
EP-terrestrial	[mol N-Eq.]	1,18E-01	2,49E-04	8,28E-03	9,57E-03	1,25E-04	0,00E+00	0,00E+00	-7,84E-02
POCP	[kg NMVOC-Eq.]	3,47E-02	5,27E-05	1,98E-03	2,30E-03	2,64E-05	0,00E+00	0,00E+00	-2,41E-02
ADPE	[kg Sb-Eq.]	4,49E-04	3,14E-09	1,76E-08	2,01E-08	1,57E-09	0,00E+00	0,00E+00	-1,41E-07
ADPF	[MJ]	1,81E+02	6,49E-01	3,62E+00	4,14E+00	3,24E-01	0,00E+00	0,00E+00	-1,00E+02
WDP	[m <sup>3</sup> world-Eq deprived]	7,13E-01	5,76E-04	2,92E-02	3,92E-03	2,88E-04	0,00E+00	0,00E+00	-1,93E-01

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

#### RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1m<sup>2</sup> Steel profile-Trapezoidal 35/207

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	1,61E+01	4,72E-02	2,85E+00	3,14E-01	2,36E-02	0,00E+00	0,00E+00	1,63E+01
PERM	[MJ]	2,54E+00	0,00E+00	-2,54E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	1,87E+01	4,72E-02	3,12E-01	3,14E-01	2,36E-02	0,00E+00	0,00E+00	1,63E+01
PENRE	[MJ]	1,79E+02	6,51E-01	7,36E+00	4,16E+00	3,26E-01	0,00E+00	0,00E+00	-1,01E+02
PENRM	[MJ]	3,73E+00	0,00E+00	-3,73E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	1,83E+02	6,51E-01	3,63E+00	4,16E+00	3,26E-01	0,00E+00	0,00E+00	-1,01E+02
SM	[kg]	1,47E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	1,74E-22	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	2,04E-21	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m <sup>3</sup> ]	2,57E-02	5,17E-05	9,08E-04	3,40E-04	2,59E-05	0,00E+00	0,00E+00	-8,72E-03

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 resources 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 = Use of net fresh water

#### RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1m<sup>2</sup> Steel profile-Trapezoidal 35/207

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	5,72E-06	2,02E-12	6,16E-12	1,08E-11	1,01E-12	0,00E+00	0,00E+00	-4,22E-10
NHWD	[kg]	8,99E-01	9,93E-05	4,82E-03	6,48E-04	4,97E-05	0,00E+00	0,00E+00	-1,99E-01
RWD	[kg]	2,75E-03	1,22E-06	2,18E-05	1,17E-05	6,10E-07	0,00E+00	0,00E+00	1,62E-03
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]	7,22E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,65E+00	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
EEE	[MJ]	3,24E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	6,20E-01	0,00E+00	0,00E+00	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



**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:  
1m<sup>2</sup> Steel profile-Trapezoidal 35/207**

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	6,41E-07	4,47E-10	3,02E-08	3,53E-08	2,24E-10	0,00E+00	0,00E+00	-4,40E-07
IRP	[kBq U235-Eq.]	3,80E-01	1,82E-04	3,46E-03	1,82E-03	9,09E-05	0,00E+00	0,00E+00	1,74E-01
ETP-fw	[CTUe]	4,28E+01	4,61E-01	2,53E+00	2,93E+00	2,30E-01	0,00E+00	0,00E+00	-1,74E+01
HTP-c	[CTUh]	2,12E-08	9,43E-12	5,41E-11	6,01E-11	4,72E-12	0,00E+00	0,00E+00	-2,06E-08
HTP-nc	[CTUh]	2,43E-07	5,02E-10	3,51E-09	3,94E-09	2,51E-10	0,00E+00	0,00E+00	-8,01E-08
SQP	[-]	4,84E+01	2,71E-01	1,50E+00	1,73E+00	1,36E-01	0,00E+00	0,00E+00	9,18E+00

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1m<sup>2</sup> Steel profile-  
Standing seam profile**

Core Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> -Eq.]	1,98E+01	5,22E-02	6,25E-01	3,34E-01	2,61E-02	0,00E+00	0,00E+00	-1,46E+01
GWP-fossil	[kg CO <sub>2</sub> -Eq.]	2,01E+01	5,16E-02	2,92E-01	3,29E-01	2,58E-02	0,00E+00	0,00E+00	-1,46E+01
GWP-biogenic	[kg CO <sub>2</sub> -Eq.]	-3,27E-01	1,52E-04	3,30E-01	1,31E-03	7,62E-05	0,00E+00	0,00E+00	2,81E-02
GWP-luluc	[kg CO <sub>2</sub> -Eq.]	7,94E-03	4,78E-04	2,57E-03	3,03E-03	2,39E-04	0,00E+00	0,00E+00	-6,00E-03
ODP	[kg CFC11-Eq.]	2,02E-11	6,71E-15	4,47E-12	6,64E-14	3,36E-15	0,00E+00	0,00E+00	4,19E-11
AP	[mol H <sup>+</sup> -Eq.]	4,81E-02	6,62E-05	1,69E-03	1,92E-03	3,31E-05	0,00E+00	0,00E+00	-3,27E-02
EP-freshwater	[kg P-Eq.]	2,02E-05	1,89E-07	1,04E-06	1,20E-06	9,43E-08	0,00E+00	0,00E+00	-1,13E-06
EP-marine	[kg N-Eq.]	1,19E-02	2,24E-05	8,11E-04	9,37E-04	1,12E-05	0,00E+00	0,00E+00	-7,85E-03
EP-terrestrial	[mol N-Eq.]	1,28E-01	2,70E-04	9,02E-03	1,04E-02	1,35E-04	0,00E+00	0,00E+00	-8,50E-02
POCP	[kg NMVOC-Eq.]	3,77E-02	5,71E-05	2,16E-03	2,49E-03	2,85E-05	0,00E+00	0,00E+00	-2,61E-02
ADPE	[kg Sb-Eq.]	4,92E-04	3,40E-09	1,91E-08	2,17E-08	1,70E-09	0,00E+00	0,00E+00	-1,53E-07
ADPF	[MJ]	1,99E+02	7,03E-01	3,94E+00	4,48E+00	3,51E-01	0,00E+00	0,00E+00	-1,09E+02
WDP	[m <sup>3</sup> world-Eq deprived]	6,62E-01	6,23E-04	4,15E-02	4,24E-03	3,12E-04	0,00E+00	0,00E+00	-2,10E-01

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

**RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1m<sup>2</sup>  
Steel profile-Standing seam profile**

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	1,71E+01	5,12E-02	4,30E+00	3,41E-01	2,56E-02	0,00E+00	0,00E+00	1,76E+01
PERM	[MJ]	3,96E+00	0,00E+00	-3,96E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	2,11E+01	5,12E-02	3,44E-01	3,41E-01	2,56E-02	0,00E+00	0,00E+00	1,76E+01
PENRE	[MJ]	1,97E+02	7,06E-01	7,17E+00	4,50E+00	3,53E-01	0,00E+00	0,00E+00	-1,10E+02
PENRM	[MJ]	3,22E+00	0,00E+00	-3,22E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	2,01E+02	7,06E-01	3,95E+00	4,50E+00	3,53E-01	0,00E+00	0,00E+00	-1,10E+02
SM	[kg]	1,61E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	6,25E-22	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	7,34E-21	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m <sup>3</sup> ]	2,53E-02	5,60E-05	1,22E-03	3,68E-04	2,80E-05	0,00E+00	0,00E+00	-9,51E-03

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 = Use of net fresh water

**RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2:  
1m<sup>2</sup> Steel profile- Standing seam profile**

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	6,27E-06	2,18E-12	7,25E-12	1,17E-11	1,09E-12	0,00E+00	0,00E+00	-5,13E-10
NHWD	[kg]	8,97E-01	1,08E-04	7,23E-03	7,02E-04	5,38E-05	0,00E+00	0,00E+00	-2,15E-01
RWD	[kg]	2,90E-03	1,32E-06	2,49E-05	1,27E-05	6,60E-07	0,00E+00	0,00E+00	1,71E-03
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]	6,58E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,20E+00	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
EEE	[MJ]	4,74E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	8,65E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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; EEE = Exported electrical energy; EET = Exported thermal energy

**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:  
1m<sup>2</sup> Steel profile- Standing seam profile**

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	7,10E-07	4,85E-10	3,28E-08	3,83E-08	2,42E-10	0,00E+00	0,00E+00	-4,77E-07
IRP	[kBq U235-Eq.]	3,32E-01	1,97E-04	3,97E-03	1,97E-03	9,85E-05	0,00E+00	0,00E+00	1,81E-01
ETP-fw	[CTUe]	4,32E+01	4,99E-01	2,75E+00	3,18E+00	2,50E-01	0,00E+00	0,00E+00	-1,89E+01
HTP-c	[CTUh]	2,34E-08	1,02E-11	5,96E-11	6,51E-11	5,11E-12	0,00E+00	0,00E+00	-2,23E-08
HTP-nc	[CTUh]	2,60E-07	5,44E-10	3,87E-09	4,27E-09	2,72E-10	0,00E+00	0,00E+00	-8,69E-08
SQP	[-]	6,79E+01	2,94E-01	1,63E+00	1,87E+00	1,47E-01	0,00E+00	0,00E+00	9,90E+00

**Caption** PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1m<sup>2</sup> Steel profile-Liner tray

Core Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> -Eq.]	2,47E+01	6,83E-02	7,57E-01	4,37E-01	3,42E-02	0,00E+00	0,00E+00	-1,90E+01
GWP-fossil	[kg CO <sub>2</sub> -Eq.]	2,51E+01	6,75E-02	3,75E-01	4,31E-01	3,37E-02	0,00E+00	0,00E+00	-1,91E+01
GWP-biogenic	[kg CO <sub>2</sub> -Eq.]	-3,60E-01	1,99E-04	3,78E-01	1,71E-03	9,97E-05	0,00E+00	0,00E+00	3,68E-02
GWP-luluc	[kg CO <sub>2</sub> -Eq.]	9,85E-03	6,25E-04	3,36E-03	3,97E-03	3,13E-04	0,00E+00	0,00E+00	-7,86E-03
ODP	[kg CFC11-Eq.]	2,16E-11	8,79E-15	1,79E-13	8,69E-14	4,39E-15	0,00E+00	0,00E+00	5,49E-11
AP	[mol H <sup>+</sup> -Eq.]	6,02E-02	8,67E-05	2,20E-03	2,52E-03	4,33E-05	0,00E+00	0,00E+00	-4,28E-02
EP-freshwater	[kg P-Eq.]	2,05E-05	2,47E-07	1,35E-06	1,57E-06	1,23E-07	0,00E+00	0,00E+00	-1,47E-06
EP-marine	[kg N-Eq.]	1,48E-02	2,94E-05	1,06E-03	1,23E-03	1,47E-05	0,00E+00	0,00E+00	-1,03E-02
EP-terrestrial	[mol N-Eq.]	1,60E-01	3,53E-04	1,18E-02	1,36E-02	1,77E-04	0,00E+00	0,00E+00	-1,11E-01
POCP	[kg NMVOC-Eq.]	4,71E-02	7,47E-05	2,82E-03	3,26E-03	3,74E-05	0,00E+00	0,00E+00	-3,42E-02
ADPE	[kg Sb-Eq.]	6,27E-04	4,45E-09	2,50E-08	2,85E-08	2,22E-09	0,00E+00	0,00E+00	-2,00E-07
ADPF	[MJ]	2,38E+02	9,20E-01	5,14E+00	5,87E+00	4,60E-01	0,00E+00	0,00E+00	-1,42E+02
WDP	[m <sup>3</sup> world-Eq deprived]	8,05E-01	8,16E-04	4,77E-02	5,55E-03	4,08E-04	0,00E+00	0,00E+00	-2,75E-01

**Caption** GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

### RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1m<sup>2</sup> Steel profile-Liner tray

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	2,03E+01	6,70E-02	4,98E+00	4,46E-01	3,35E-02	0,00E+00	0,00E+00	2,31E+01
PERM	[MJ]	4,53E+00	0,00E+00	-4,53E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	2,48E+01	6,70E-02	4,47E-01	4,46E-01	3,35E-02	0,00E+00	0,00E+00	2,31E+01
PENRE	[MJ]	2,40E+02	9,24E-01	5,50E+00	5,89E+00	4,62E-01	0,00E+00	0,00E+00	-1,44E+02
PENRM	[MJ]	3,41E-01	0,00E+00	-3,41E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	2,40E+02	9,24E-01	5,16E+00	5,89E+00	4,62E-01	0,00E+00	0,00E+00	-1,44E+02
SM	[kg]	2,05E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	2,59E-22	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	3,05E-21	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m <sup>3</sup> ]	2,99E-02	7,33E-05	1,44E-03	4,82E-04	3,67E-05	0,00E+00	0,00E+00	-1,24E-02

**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 = Use of net fresh water

### RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1m<sup>2</sup> Steel profile-Liner tray

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	7,99E-06	2,86E-12	9,17E-12	1,53E-11	1,43E-12	0,00E+00	0,00E+00	-6,26E-10
NHWD	[kg]	1,14E+00	1,41E-04	8,38E-03	9,19E-04	7,04E-05	0,00E+00	0,00E+00	-2,82E-01
RWD	[kg]	3,14E-03	1,73E-06	3,17E-05	1,66E-05	8,64E-07	0,00E+00	0,00E+00	2,27E-03
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]	2,04E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,42E+00	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
EEE	[MJ]	5,34E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	9,62E-01	0,00E+00	0,00E+00	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

### RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1m<sup>2</sup> Steel profile-Liner tray

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	8,90E-07	6,34E-10	4,29E-08	5,01E-08	3,17E-10	0,00E+00	0,00E+00	-6,24E-07
IRP	[kBq U235-Eq.]	3,46E-01	2,58E-04	5,08E-03	2,57E-03	1,29E-04	0,00E+00	0,00E+00	2,43E-01
ETP-fw	[CTUe]	4,76E+01	6,53E-01	3,60E+00	4,16E+00	3,27E-01	0,00E+00	0,00E+00	-2,47E+01
HTP-c	[CTUh]	2,93E-08	1,34E-11	7,74E-11	8,53E-11	6,69E-12	0,00E+00	0,00E+00	-2,92E-08
HTP-nc	[CTUh]	3,18E-07	7,12E-10	5,03E-09	5,59E-09	3,56E-10	0,00E+00	0,00E+00	-1,14E-07
SQP	[-]	7,68E+01	3,84E-01	2,13E+00	2,45E+00	1,92E-01	0,00E+00	0,00E+00	1,30E+01

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2 1 kg Steel profile with production processes

Core Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> -Eq.]	2,75E+00	7,25E-03	7,43E-02	4,63E-02	3,62E-03	0,00E+00	0,00E+00	-2,02E+00
GWP-fossil	[kg CO <sub>2</sub> -Eq.]	2,75E+00	7,16E-03	4,20E-02	4,57E-02	3,58E-03	0,00E+00	0,00E+00	-2,02E+00
GWP-biogenic	[kg CO <sub>2</sub> -Eq.]	2,43E-03	2,12E-05	3,19E-02	1,81E-04	1,06E-05	0,00E+00	0,00E+00	3,91E-03
GWP-luluc	[kg CO <sub>2</sub> -Eq.]	1,07E-03	6,64E-05	3,56E-04	4,21E-04	3,32E-05	0,00E+00	0,00E+00	-8,34E-04
ODP	[kg CFC11-Eq.]	3,19E-11	9,32E-16	2,26E-12	9,22E-15	4,66E-16	0,00E+00	0,00E+00	5,84E-12
AP	[mol H <sup>+</sup> -Eq.]	6,64E-03	9,20E-06	2,33E-04	2,67E-04	4,60E-06	0,00E+00	0,00E+00	-4,54E-03
EP-freshwater	[kg P-Eq.]	1,43E-05	2,62E-08	1,43E-07	1,67E-07	1,31E-08	0,00E+00	0,00E+00	-1,55E-07
EP-marine	[kg N-Eq.]	1,68E-03	3,12E-06	1,12E-04	1,30E-04	1,56E-06	0,00E+00	0,00E+00	-1,09E-03
EP-terrestrial	[mol N-Eq.]	1,77E-02	3,75E-05	1,25E-03	1,44E-03	1,88E-05	0,00E+00	0,00E+00	-1,18E-02
POCP	[kg NMVOC-Eq.]	5,19E-03	7,93E-06	2,98E-04	3,46E-04	3,96E-06	0,00E+00	0,00E+00	-3,63E-03
ADPE	[kg Sb-Eq.]	6,75E-05	4,72E-10	2,65E-09	3,02E-09	2,36E-10	0,00E+00	0,00E+00	-2,12E-08
ADPF	[MJ]	2,65E+01	9,76E-02	5,44E-01	6,23E-01	4,88E-02	0,00E+00	0,00E+00	-1,51E+01
WDP	[m <sup>3</sup> world-Eq deprived]	1,07E-01	8,66E-05	4,39E-03	5,89E-04	4,33E-05	0,00E+00	0,00E+00	-2,91E-02

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

### RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg Steel profile with production processes

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	2,33E+00	7,10E-03	4,29E-01	4,73E-02	3,55E-03	0,00E+00	0,00E+00	2,45E+00
PERM	[MJ]	3,82E-01	0,00E+00	-3,82E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	2,72E+00	7,10E-03	4,69E-02	4,73E-02	3,55E-03	0,00E+00	0,00E+00	2,45E+00
PENRE	[MJ]	2,66E+01	9,80E-02	6,14E-01	6,25E-01	4,90E-02	0,00E+00	0,00E+00	-1,52E+01
PENRM	[MJ]	6,86E-02	0,00E+00	-6,86E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	2,67E+01	9,80E-02	5,46E-01	6,25E-01	4,90E-02	0,00E+00	0,00E+00	-1,52E+01
SM	[kg]	2,21E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	2,62E-23	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	3,07E-22	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m <sup>3</sup> ]	3,76E-03	7,78E-06	1,37E-04	5,12E-05	3,89E-06	0,00E+00	0,00E+00	-1,31E-03

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 = Use of net fresh water

### RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg Steel profile with production processes

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	8,60E-07	3,03E-13	9,26E-13	1,63E-12	1,52E-13	0,00E+00	0,00E+00	-6,35E-11
NHWD	[kg]	1,35E-01	1,49E-05	7,25E-04	9,75E-05	7,47E-06	0,00E+00	0,00E+00	-2,99E-02
RWD	[kg]	4,04E-04	1,83E-07	3,28E-06	1,76E-06	9,17E-08	0,00E+00	0,00E+00	2,44E-04
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]	7,72E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,00E+00	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
EEE	[MJ]	4,88E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	9,33E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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; EEE = Exported electrical energy; EET = Exported thermal energy

### RESULTS OF THE LCA - additional impact categories according to EN 15804+A2-optional: 1 kg Steel Sheet with auxiliary processes



Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	9,61E-08	6,73E-11	4,54E-09	5,32E-09	3,36E-11	0,00E+00	0,00E+00	-6,62E-08
IRP	[kBq U235-Eq.]	5,62E-02	2,73E-05	5,20E-04	2,73E-04	1,37E-05	0,00E+00	0,00E+00	2,62E-02
ETP-fw	[CTUe]	6,08E+00	6,93E-02	3,81E-01	4,41E-01	3,47E-02	0,00E+00	0,00E+00	-2,61E+00
HTP-c	[CTUh]	3,18E-09	1,42E-12	8,13E-12	9,05E-12	7,09E-13	0,00E+00	0,00E+00	-3,09E-09
HTP-nc	[CTUh]	3,62E-08	7,55E-11	5,29E-10	5,93E-10	3,78E-11	0,00E+00	0,00E+00	-1,20E-08
SQP	[-]	7,22E+00	4,08E-02	2,26E-01	2,60E-01	2,04E-02	0,00E+00	0,00E+00	1,38E+00

Caption	PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index
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Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”.

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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”.

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.