Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019/AC:2021 for:

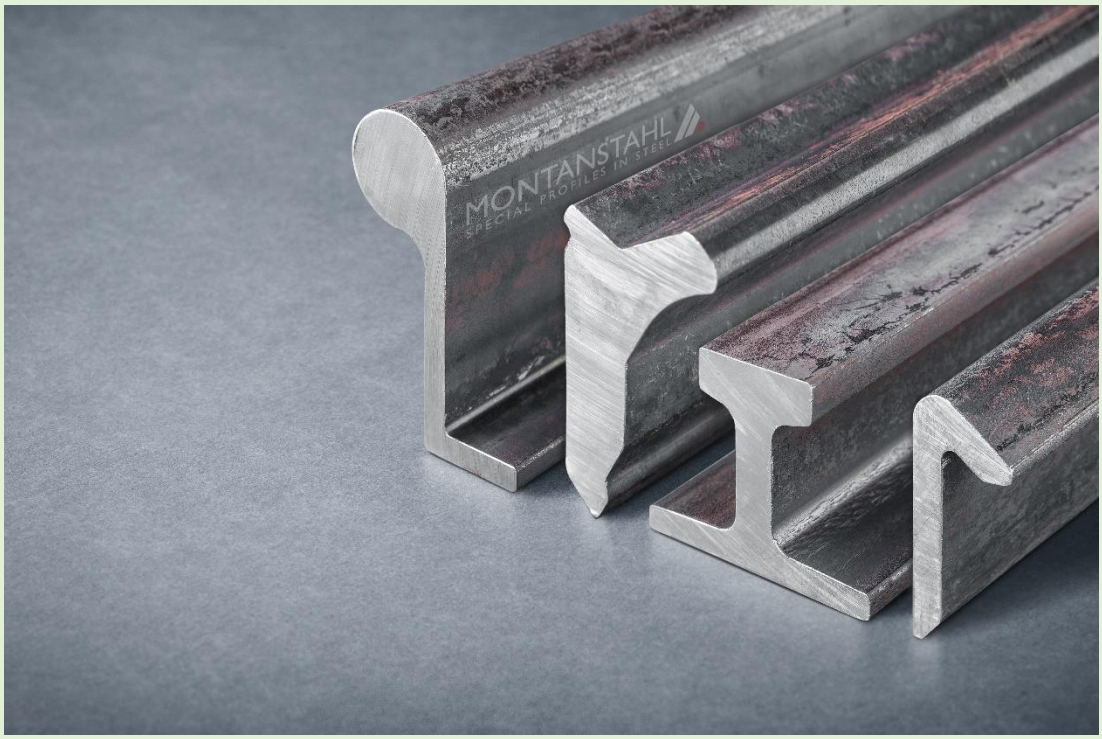
Hot rolled carbon steel profiles

.

MONTANSTAHL AG
Via Gerrette 2, Zona Industriale 5, CH-6855 Stabio, Switzerland

PROGRAMME:	The International EPD® System. www.environdec.com
PROGRAMME OPERATOR:	EPD International AB
EPD REGISTRATION NUMBER:	EPD-IES-0017176
PUBLICATION DATE:	2024-10-17
VALID UNTIL:	2029-10-16

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same version number up to the first two digits) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

1. GENERAL INFORMATION

MANUFACTURER	Montanstahl AG
PROGRAMME USED	The International EPD® System. For more information see www.environdec.com
EPD REGISTRATION NUMBER/DECLARATION NUMBER	EPD-IES-0017176
PRODUCT / PRODUCT FAMILY NAME AND MANUFACTURER REPRESENTED	Hot rolled carbon steel profiles, manufactured by Montanstahl AG.
PRODUCT DESCRIPTION AND USE	Hot rolled carbon steel profiles destined primarily for the use in the sector of construction, general industry, automotive.
DECLARATION ISSUED	2024-10-17
VALID UNTIL	2029-10-16
OWNER OF DECLARATION	Montanstahl AG, Via Gerrette 2 Zona Industriale 5 CH-6855 Stabio, Switzerland. Tel. +41 (0)91 641 68 00, info@montanstahl.com
EPD PREPARED BY	Ergo s.r.l, www.ergosrl.net
SCOPE	The LCA is based on 2023 production data for hot rolled carbon steel profiles manufactured by Montanstahl manufacturing plant in Switzerland. This EPD covers information modules production stage A1-A3, end-of life stages C1-C4 and resource recovery stage D (cradle to gate with module C1-C4, module D) according to EN 15804:2012+A2:2019/AC:2021.
FUNCTIONAL UNIT / DECLARED UNIT	The declared unit (DU) is 1 metric ton of hot rolled carbon steel profiles plus packaging.

CEN standard EN 15804 served as the core Product Category Rules–PCR	
PCR:	PCR 2019:14 Construction products and construction services, Version 1.3.4.
Product group classification:	The UN CPC code of the product is 412" Products of iron or steel"
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Claudia A. Peña. email: info@environdec.com
Independent verification of the declaration and data, according to ISO 14025:	☐ EPD process certification ☒ EPD verification
Third party verifier:	RINA Services S.p.A.Via Corsica 12, Genova - Italy Tel +39 010 -5385306 - www.rina.org ACCREDIA Registration number: 0002-VV
Accredited or approved by:	The International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier:	☐Yes ☒No

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

2. ABOUT THE COMPANY

Montanstahl is a dynamic family-owned company active in the production and supply of high-quality special steel shapes. Established 1983 in Stabio, Switzerland, Montanstahl has achieved a high level of knowhow and ranks among the worldwide market leaders in its business segment. Demand for custom-tailored products is continuously rising and Montanstahl adapts to these market requests by investing in innovative manufacturing technologies. Montanstahl is a specialized in the production and supply of high-quality steel profiles for various industries, such as building & construction, energy & nuclear, wastewater treatment, maritime, food & beverage, and many more.
Montanstahl supply structural profiles and custom profiles in a wide variety of carbon steel and stainless-steel grades destined for the use in the sector of construction, general industry, automotive. The years of expertise and innovative production technologies combined allow Montanstahl to work with many different materials. Montanstahl has obtained several certifications on Quality management (ISO 9001), product approval (EN 1090-1, EN 10025-2, EN 10088-5, EN 3834-2, EN 1090-1, EN 1090-2, EN 15085-2) and sustainability (Voluntary Climate Protection and Energy Efficiency, Hydroelectric Energy).

3. PRODUCT INFORMATION

3.1 Product description and use

This declaration refers to the hot rolled carbon steel profiles with a wide range of steel grades, used to be applied in construction, general industry, automotive sectors. Montanstahl offers different production technologies with which produces standard and special profiles and shapes. The choice of the production method for a profile depends on its overall size, its complexity, its surface finish, its tolerance, and the required lot size. Every production technology has its own peculiarities and is ideal for specific shapes. In detail, the products covered by this EPD are hot rolled steel profiles manufactured by hot rolling process.

3.2 Technical data

Main technical data referred to hot rolled carbon steel profiles are given in Table 1 and Table 2. This EPD is valid for products of various grades and geometries, as well as different forms of delivery.

Table 1 – *Technical information.*

Reference Standards	10025-2, EN 10084, EN 10083-2, EN 10132, EN 683-1, EN 683-2, EN 683-3, EN 683-4, DIN 17212
Quality steel grade	S355- S235; C15, C45, CF53, 25 Cr Mo 4, 18NiCrMo 5, 11SMnPb 30, C67
Tensile strength (N/mm2)	360-800
Stretching range (%)	12-23

Table 2 – *Range of technical information of hot rolled carbon steel profiles.*

	Hot rolling
Material thickness	min. 2.5 mm
Size range	fit in circle of max. 90 mm
Weight	from 0.5 kg/m to 10 kg/m
General tolerances	± 0.5 mm

3.3 Geographical scope
Montanstahl's hot rolled carbon steel profiles are manufactured in Switzerland and distributed globally.

3.4. Time representativeness
Data describing the acquisition of raw materials and manufacturing process covers production year 2023. The background data used in the study have been applied through Ecoinvent datasets which are less than 10 years old.

3.5 Base materials / Ancillary materials
Main materials of the studied steel profiles, including the packaging, are reported in Table 3. The base material of steel is an alloy of iron and carbon. Other elements such as Nickel, Manganese, Copper may be present, depending on the steel designation/grade.

Table 3 – *Content declaration of hot rolled carbon steel profiles and relative packaging.*

Product components	Weight, kg	Post-consumer material*, weight %	Biogenic material**, weight-% and kg C/declared unit
Carbon steel	1,000	N.A.	0
Packaging	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/declared unit**
Ferrous metals	0.453	0.05%	0
Wood	3.998	0.40%	2.00
Plastic	0.016	0.002%	0
Sum	4.467		2.00

* An estimated percentage of recycled material in the steel is 68%, calculated as a weighted average of the recycled content associated with the incoming raw material. Separated values deriving from pre and post consumption are not available.
**Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

3.6 Packaging
Montanstahl has different types of standard packaging procedures depending on the type of product, its size, the technology used to create it and the surface finish requested by the customer.

The profiles are bundled up and packed in such a way as to guarantee the safety of the operators, both internal and external, who handle these materials, and the bundles are arranged with a width-height ratio that ensures their stability. The most frequently used packaging methods are bundles wrapped in wooden blocks and strapped with steel. The bars can be stamped with the Montanstahl logo, the casting number, the material used and the dimensions. Once gathered in bundles, they are then labelled with all the necessary references for shipping.

3.7 Reference service life

For the products under study, it is not possible to quantify the exact useful life as much also depends on their future use. However, it is emphasized that even when the deadline is reached, the product can be recycled and reused again to generate other raw materials.

3.8 Recycling / Re-use phase

Steel can be recycled without any damage or degradation to its properties.

3.9 Disposal

The European waste catalogue code is 17 04 05.

3.10 Further information

Further information can be found through the enquiry desk:
Tel. +41 (0)91 641 68 00 - +41 (0)91 641 68 01, info@montanstahl.com

3.11 Manufacture

Montanstahl's steel profiles are manufactured using hot rolling production technology with which produces standard and special profiles and shapes, showed in the Figures 1 below. The semifinished steel products used to produce profiles are imported by different suppliers located worldwide. They are purchased in form of wire rods.

Hot Rolling

Hot rolled special profiles are produced by forming wire rod, which can have a diameter of max. 60 mm, by a continuous rolling process at a temperature of about 1100°C. Hot rolling is by far the most popular and well-known technology to produce steel profiles. Montanstahl can roll special profiles in a large variety of steel grades like carbon steel, low and high-alloyed steel as well as stainless steel. In this EPD only carbon steel profiles are considered. Montanstahl supplies these special sections either in bars or coiled up again to suite downstream processes like cold drawing.

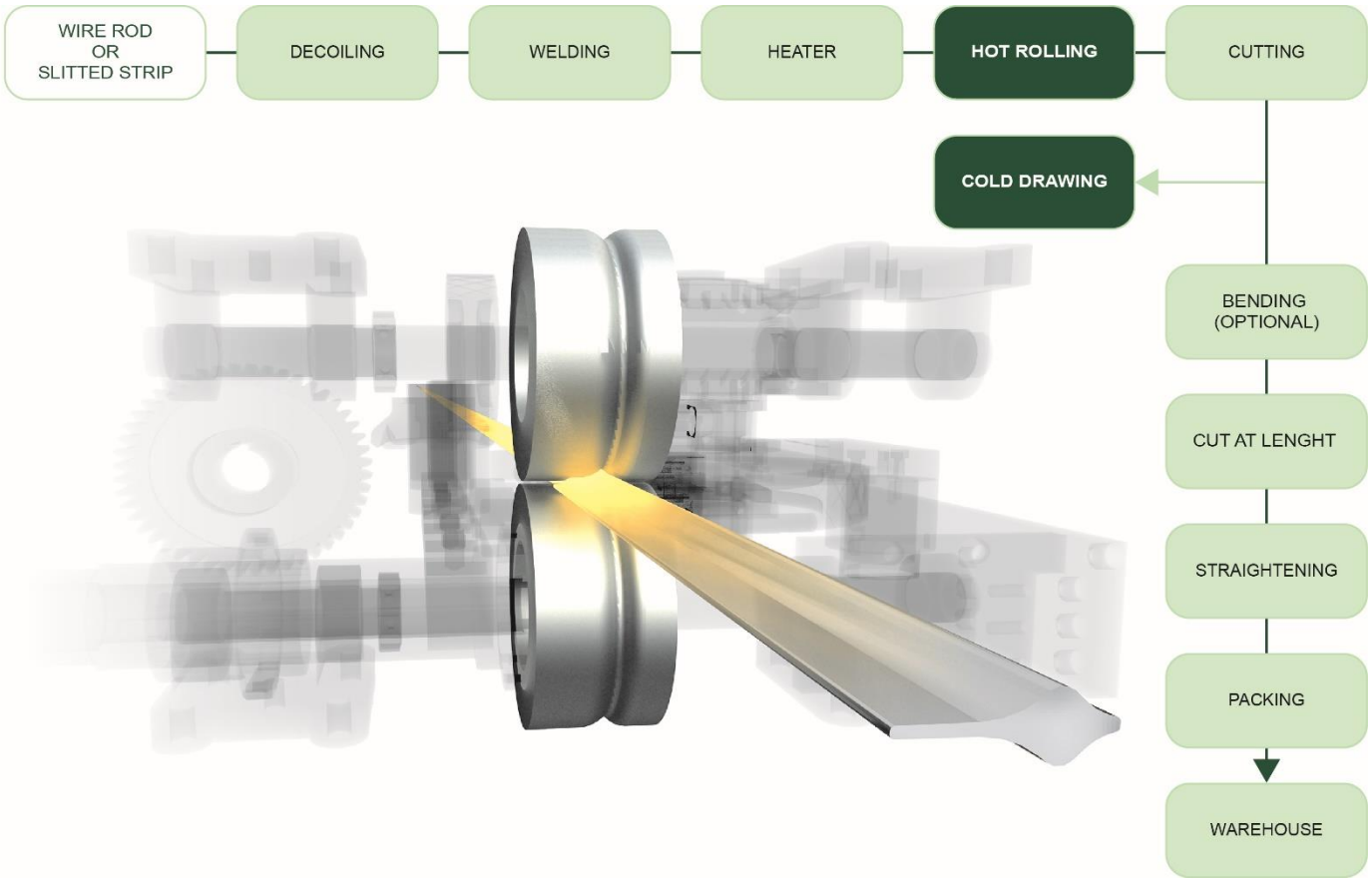


Figure 1. *Carbon steel profiles manufacturing process – Hot Rolling*

4. LCA INFORMATION

Figure 2 shows a flow diagram of the system under study. The system boundary covers A1 - A3 product stages referred as 'Raw material supply', 'Transport' and 'Manufacturing'. In addition to the manufacturing phase (modules A1-A3), this EPD contains the End-of-life stage (de-construction and demolition as C1; transport to waste processing as C2; waste processing for reuse, recovery and/or recycling as C3; disposal as C4; benefits and loads beyond the system boundary, as module D). Accordingly, the EPD is a cradle-to-gate declaration with module C1-C4, module D. The system boundaries in tabular form for all modules are shown in the Table 4 below.

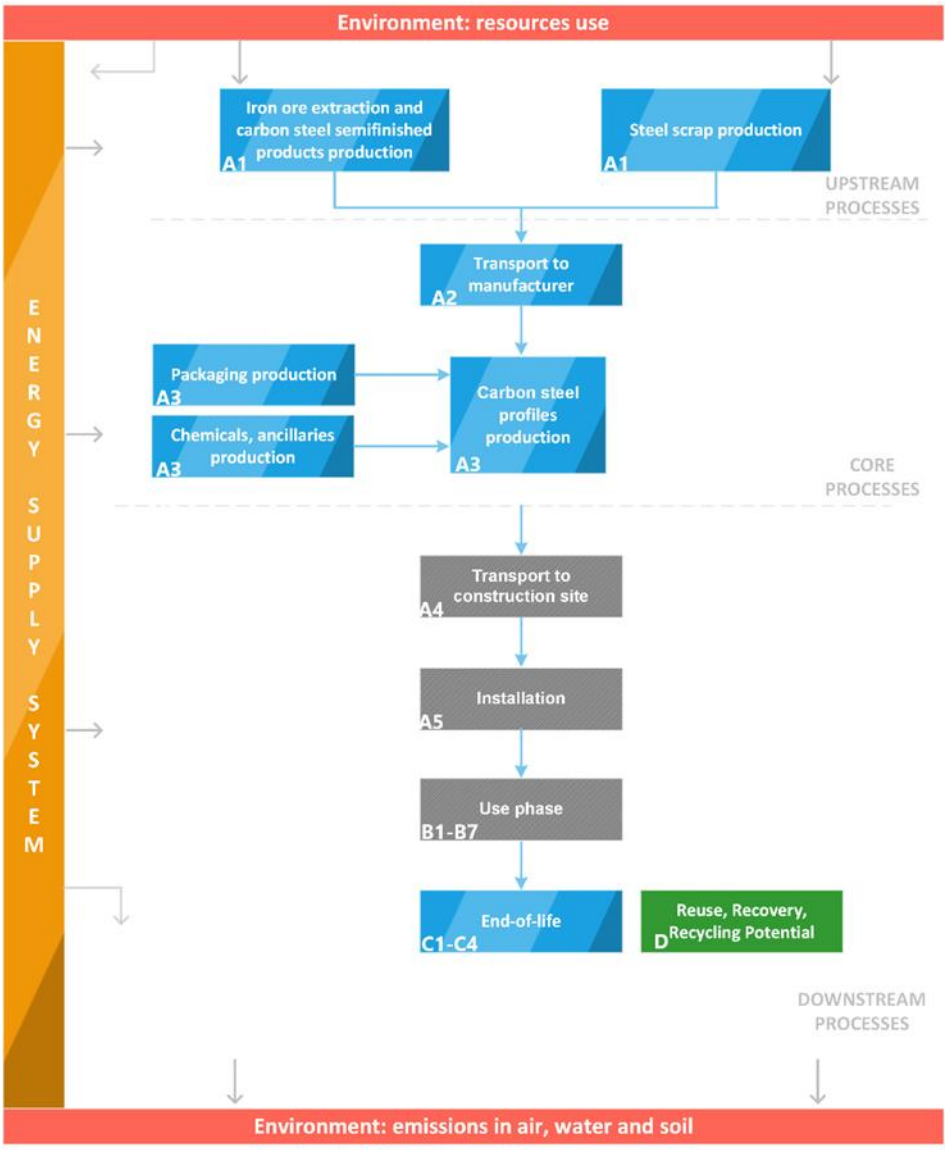


Figure 2 – *Flow diagram of system boundary under assessment (in grey the excluded processes).*

Table 4 – *System boundaries chosen for the LCA (X-module included in LCA. MND – module not included. NA – not applicable).*

	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	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse Recovery Recycling potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Module declared	**X**	**X**	**X**	MND	MND	MND	MND	MND	MND	MND	MND	MND	**X**	**X**	**X**	**X**	**X**
Geography	**EU 27/ GLO**	**EU 27/ GLO**	**CH**	-	-	-	-	-	-	-	-	-	**EU 27**	**EU 27**	**EU 27**	**EU 27**	**EU 27**
Share of specific data	**24% on GWP - GHG**																
Variation products	**NA**																
Variation sites	**NA**																

5. LCA CALCULATION RULES

LCA calculation rules are reported in Table 5.

Table 5 – *LCA calculation rules.*

5.1	**FUNCTIONAL UNIT/ DECLARED UNIT**	The declared unit is 1 metric ton of hot rolled carbon steel profiles.
5.2	**SYSTEM BOUNDARIES**	The study is "Cradle to gate with modules C1 – C4 and module D (A1 – A3 + C + D)". The modularity and “polluter-pays” principles were followed.
5.3	**ESTIMATES AND ASSUMPTIONS**	• Datasets from Ecoinvent 3.9 with emission factors for raw materials have been characterized to adjust them to the characteristics of manufacturing of Montanstahl suppliers or countries where suppliers are located. All transports of steel semifinished purchased, chemicals and other components have been included in the LCA considering real distances travelled by materials used from January – December 2023. For the production of chemicals, auxiliaries and packaging materials (and their disposal), generic data have been used, make them country specific whenever possible. • The electricity mix of Montanstahl plant is characterized by 100% of hydroelectricity purchased from an external energy supplier. The origin of the renewable electricity status is evidenced by Guarantee of Origin certificates (GOs). • An average of 50 km is taken as a distance from construction site to waste processing and disposal sites (C2). A transport distance from construction site to recovery treatment site of 80 km was assumed. Waste processing for reuse, recovery and/or recycling is taken into consideration for the current study (C3). At the end of life of the product, 95% of carbon steel is collected to be recycled and the rest ends up at landfills according to European steel recycling statistics (C4). Potential impacts and avoided burdens resulting from the packaging and steel scrap recycling in the end of life are assigned to module D.
5.4	**CUT-OFF RULES**	All major raw materials and all the essential energy is included. General cut-off criteria are given in standard EN 15804:2012+A2:2019/AC:2021 Clause 6.3.6 In compliance with these criteria, the infrastructure of the manufacturing site/ LCI dataset, and personnel related activities (travel, office operations and supplies) are excluded from the study.

5.5	**BACKGROUND DATA**	All primary product data was provided by Montanstahl plant. All secondary data was retrieved using SIMAPRO 9.6 software, with Ecoinvent 3.9 database.
5.6	**DATA QUALITY**	Manufacturing facility specific data from Montanstahl are based on 1 year average for process data. The following rules for time scope of data were applied - < 10 years for background data and < 2 years for manufacturer's data. The quality level concerning datasets used in the EPD can be considered as ”good” according to Annex E of the EN 15804 (current version).
5.7	**PERIOD UNDER REVIEW**	The data is representative of the manufacturing processes of 2023 year (January-December).
5.8	**ALLOCATIONS**	According to ISO 14040 and 14044, for the allocation procedure physical properties are used to drive flow analysis.

Description of system boundaries

This EPD evaluates the environmental impacts of 1 metric ton of hot rolled carbon steel profiles from cradle to gate with module C1-C4, D. Within the Life Cycle Assessment of the declared steel profiles, the following processes are considered:

Product stage, A1-A3

DESCRIPTION OF THE STAGE

The product stage of the steel products is subdivided into three modules: A1, A2 and A3 respectively “raw material supply”, “transport” and “manufacturing”.

A1, RAW MATERIAL SUPPLY

This includes the extraction and processing of all raw materials and energy which occur upstream from the manufacturing process.

A2, TRANSPORT TO THE MANUFACTURER

The external transportation of raw materials, chemicals, auxiliary and packaging materials to the manufacturing site. The modelling includes transportation with truck, train and ship with processes for each supplier.

A3, MANUFACTURING

This module includes the manufacture of main product, chemicals, auxiliaries, and packaging material. The processing of any waste arising from this stage is also included.

End-of-life stage, C1-C4

DESCRIPTION OF THE END-OF-LIFE-STAGE

The end-of-life stage includes:

C1, DE-CONSTRUCTION, DEMOLITION

Deconstruction includes dismantling or demolition of the product from the construction, including initial on-site sorting of the materials.

C2, TRANSPORT TO WASTE PROCESSING

This stage includes the transportation of the demolished items to final disposal. A transport distance to recovery treatment site of 80 km was assumed. A transport distance to landfill site of 50 km was assumed.

C3, WASTE PROCESSING FOR REUSE, RECOVERY AND/OR RECYCLING

Steel must be mechanically separated from the concrete or any other material surrounding them prior to recycling so that the steel can be made available to a downstream product system as secondary material. This is considered in module C3.

C4, DISPOSAL

Landfilling scenario of the steel waste and packaging which are not collected for recycling is considered in module C4 according to the Europe average scenario stated in PEF Annex C.
Transport and disposal of the packaging delivered together with the product to the end customer is included in module C.

Table 6 – *End-of-life stage.*

PARAMETER	VALUE (expressed per functional/declared unit)
C1) Collection process specified by type	-0.95 ton collected separately for metal recycling and transported by truck to recycling site. -0.05 ton collected with mixed construction waste and transported by truck to landfill site.
C2) Assumption for scenario development (e.g., transportation)	Diesel consumption 0.04L per tkm; 80 km from demolition site to recycling facility 50 km from demolition site to waste handle
C3) Recovery system specified by type	Product to material recovery: 0.95 ton carbon steel Packaging materials to material recovery: 0.430 kg/DU ferrous metals 1.199 kg/DU wood 0.007 kg/DU plastic
C4) Disposal specified by type	Product to landfill: 0.05 ton of waste carbon steel Packaging materials to landfill: 0.023 kg/DU ferrous metals 1.539 kg/DU wood 0.005 kg/DU plastic Packaging materials to incineration (w/o energy recovery): 1.259 kg/DU wood 0.004 kg/DU plastic

Reuse/recovery/recycling potential, D

DESCRIPTION OF THE STAGE

Module D, relating to information on the potential for reuse/recovery/recycling, is assessed considering the benefits of the avoided impact of future extractions and production of raw materials, brought about by the recycling of the packaging materials. The processes necessary to make the materials of the product (at the end of life) new raw materials for subsequent life cycles are considered.

6. ENVIRONMENTAL INFORMATION

In the following tables, the environmental impacts per declared unit are reported for the environmental categories recommended by the EPD's General Programme Instruction (version 4.0, March 2021) and those indicated in PCR 2019:14 version 1.3.4 for Construction Products and construction services. The LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks. To obtain the results following the provisions of EN 15804:2012+A2:2019/AC:2021, the "EN 15804+A2 (adapted) method", "EDIP 2003", "CED (LHV)" calculation methods have been used for environmental impacts, waste generation, and use of resources respectively.

7. RESULTS INTERPRETATION

The impact assessment phase of LCA is aimed at evaluating the significance of potential environmental impacts using the LCI results. In general, this process involves associating inventory data of specific environmental impact categories with category indicators, thereby attempting to quantify these impacts. The impact assessment and the interpretation of this study are performed according to the ISO 14040 and ISO 14044 guidelines. This document declares the results of 1 metric ton of hot rolled carbon steel profiles.
It is observed that the most influential phases in the life cycle are modules A1-A3, which collectively contribute to more than 90% of the total impact. The largest share of the total Global Warming Potential (GWP) is linked to the extraction and manufacturing of raw materials, with a particular emphasis on primary and secondary steel production (data not shown). Steel production is an intensive process requiring a lot of energy and raw materials, but increasing high levels of recycled content helps to lower this. Following these, modules C1, C2, C3, and C4 also play roles in GWP, albeit to a lesser extent, only except for climate change, biogenic.

Information about energy mix used in the manufacturing process
The energy mix purchased for the production phase is representative for Stabio production site and includes only green energy (100% hydroelectric) certified by a third party.

Greenhouse gas emissions: 0.00327 kg CO2eq/kWh

Core Environmental Impact Indicators

Table 7 – *LCA results of potential environmental impact referred to 1 metric ton of hot rolled carbon steel profiles plus packaging.*

Impact category	Unit	Product stage	End of life stage				Benefits and loads beyond the system boundary
		A1-A3	C1	C2	C3	C4	D
Climate change (GWP) – total	kg CO_2 eq	1.54E+03	7.52E-01	1.06E+01	1.31E+01	1.91E+00	-4.48E+02
Climate change (GWP) – fossil	kg CO_2 eq	1.54E+03	7.25E-01	1.06E+01	1.30E+01	1.44E-01	-4.48E+02
Climate change (GWP) – biogenic	kg CO_2 eq	4.32E+00	2.47E-02	3.22E-03	1.17E-01	1.77E+00	-4.24E-01
Climate change (GWP) – Land use, LULUC	kg CO_2 eq	3.74E-01	1.67E-03	2.09E-04	1.50E-02	7.65E-06	-1.93E-01
Ozone depletion	kg CFC11eq	3.27E-05	1.22E-08	2.30E-07	2.07E-07	2.33E-09	-1.07E-05
Acidification	mol H+eq	5.17E+00	3.86E-03	2.68E-02	1.01E-01	1.51E-03	-1.69E+00
Eutrophication, aquatic freshwater	kg P eq	4.94E-01	6.10E-04	7.27E-05	2.76E-03	1.01E-05	-2.03E-01
Eutrophication, aquatic marine	kg N eq	1.31E+00	8.65E-04	1.04E-02	4.31E-02	1.18E-03	-3.98E-01
Eutrophication, terrestrial	mol N eq	1.36E+01	8.11E-03	1.09E-01	4.63E-01	7.67E-03	-4.10E+00
Photochemical ozone formation	kg NMVOC eq	6.89E+00	2.53E-03	4.34E-02	1.37E-01	2.25E-03	-2.18E+00

Impact category	Unit	Product stage	End of life stage				Benefits and loads beyond the system boundary
		A1-A3	C1	C2	C3	C4	D
Water use	m^3 depriv.	8.77E+02	1.55E-01	1.30E-01	8.70E-01	4.50E-03	-7.00E+01
Abiotic depletion, minerals &metals	kg Sb eq	5.92E-04	4.34E-08	3.66E-07	6.47E-07	6.06E-09	-1.32E-04
Abiotic depletion of fossil resources	MJ,net calorific value	2.08E+04	1.63E+01	1.42E+02	2.00E+02	1.69E+00	-5.52E+03

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. The use of the results of modules A1-A3, without considering the results of module C, is discouraged. "Reading example: 1.57E-03 = $1.57*10^{-3}$ = 0.00157"

Environmental impacts – GWP-GHG

Table 8 *– LCA results of GWP-GHG referred to 1 metric ton of hot rolled carbon steel profiles plus packaging.*

Impact Category	Unit	Product stage	End of life stage				Benefits and loads beyond the system boundary
		A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO_2 eq	1.54E+03	7.31E-01	1.06E+01	1.30E+01	2.39E-01	-4.48E+02

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 6 (IPCC 2021). This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Table 9 – *LCA results of use of resources referred to 1 metric ton of hot rolled carbon steel profiles plus packaging.*

Impact category	Unit	Product stage	End of life stage				Benefits and loads beyond the system boundary
		A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy (PERE)	MJ	2.86E+03	3.40E+00	3.72E-01	1.32E+01	1.74E-02	-2.87E+02
Primary energy resources used as raw materials (PERM)	MJ	5.59E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.68E+01
Total use of renewable primary energy resources (PERT)	MJ	**2.92E+03**	**3.40E+00**	**3.72E-01**	**1.32E+01**	**1.74E-02**	**-3.04E+02**
Use of non-renewable primary energy (PENRE)	MJ	2.08E+04	1.63E+01	1.42E+02	2.00E+02	1.69E+00	-5.52E+03
Non-renewable primary energy resources used as raw material (PENRM)	MJ	6.88E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.89E-01
Total use of non-renewable primary energy resources	MJ	**2.08E+04**	**1.63E+01**	**1.42E+02**	**2.00E+02**	**1.69E+00**	**-5.52E+03**
Use of secondary materials (SM)	kg	6.83E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary Fuels (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary Fuels (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water (FW)	m^3	1.75E+02	1.20E-01	2.26E-02	5.36E-01	1.69E-03	-2.30E+01

*Caption: **PERE** = Use of renewable primary energy excluding the renewable primary energy resource used as raw materials; **PERM** = Use of renewable primary energy as raw materials; **PERT** = Total use of renewable primary energy resources; **PENRE** = Use of non-renewable primary energy excluding the non-renewable primary energy resources used as raw materials; **PENRM** = Use of non-renewable primary energy 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*

End of Life - Waste

Table 10 – *LCA results of waste categories referred to 1 metric ton of hot rolled carbon steel profiles plus packaging.*

Impact category	Unit	Product stage	End of life stage				Benefits and loads beyond the system boundary
		A1-A3	C1	C2	C3	C4	D
Non-hazardous waste	kg	5.34E+02	1.80E-02	6.90E-03	9.62E-02	4.60E+01	-6.62E+01
Hazardous waste	kg	1.21E-01	2.30E-05	9.35E-04	9.63E-04	1.08E-05	-4.51E-02
Radioactive waste	kg	6.85E-02	1.14E-04	1.21E-05	5.01E-04	2.37E-07	-9.82E-03

End of Life – Outflows

Table 11 *– LCA results of output flows referred 1 metric ton of hot rolled carbon steel profiles plus packaging.*

Impact category	Unit	Product stage	End of life stage				Benefits and loads beyond the system boundary
		A1-A3	C1	C2	C3	C4	D
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	1.98E+02	0.00E+00	0.00E+00	9.52E+02	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

8. REFERENCES

Commission Recommendation (EU) 2021/2279 of 15 December 2021 on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations.

Ecoinvent. 2023. Swiss Centre for Life Cycle Assessment. supplier of Ecoinvent v3.9 database (www.ecoinvent.ch).

General principles. EPD International (2021) General Programme Instructions for the International EPD® System. Version 4.0

LCA study. Report tecnico di Life Cycle Assessment (LCA) delle famiglie di profili in acciaio al carbonio e in acciaio inossidabile (14/10/2024)

PCR. PCR 2019:14 version 1.3.4 for Construction Products and construction services.
IVL Swedish Environmental Research Institute. Swedish Environmental Protection Agency. SP Trä. Swedish Wood Preservation Institute. Swedisol. SCDA. Svenskt Limträ AB. SSAB (2019).

STANDARDS:

EN 15804:2012+A2:2019/AC:2021 "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

ISO 14025:2011-10. Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

ISO 14001:2015. Environmental management systems – Requirements with guidance for use

ISO 9001:2015. Quality management systems – Requirements

ISO 14040:2006. Environmental management – Life cycle assessment – Principles and framework

ISO 14044:2021. Environmental management – Life cycle assessment – Requirements and guidelines

Contacts for environmental product declaration:
Olga Piva – Montanstahl AG
e-mail: o.piva@montanstahl.com

For the realisation of this EPD and the LCA study. which constitutes its scientific basis. Montanstahl Stabio manufacturing plant availed itself of the technical and methodological support of a research and management consulting team of Ergo s.r.l.. spin off company of the Scuola Superiore Sant'Anna di Pisa, composed of Andrea Fontanella and Fabiana Corcelli.