ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	voestalpine AG
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-VOE-20250328-IBC1-EN
Issue date	18.09.2025
Valid to	17.09.2030

Sections, tubes and welded assemblies

voestalpine Krems GmbH

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1. General Information

voestalpine Krems GmbH

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-VOE-20250328-IBC1-EN

This declaration is based on the product category rules:

Structural steels, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

18.09.2025

Valid to

17.09.2030

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Sections, tubes and welded assemblies

Owner of the declaration

voestalpine AG
voestalpine-Straße 3
4020 Linz
Austria

Declared product / declared unit

1 ton of tubes, sections and welded assemblies consisting of them (annual average)

Scope:

The present Environmental Product Declaration refers to a declared unit of 1 ton of average tubes, sections, and welded assemblies produced by voestalpine Krems GmbH at the Krems (Austria) site. The products considered are tubes, sections, and welded assemblies made from steel strips of various grades. All produced quantities are included in the average consideration in the form of an annual average. Subsequent external galvanizing and coating of the products are not part of the consideration.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Dr. Marco Muhl,
(Independent verifier)

2. Product

2.1 Product description/Product definition

voestalpine Krems GmbH specializes in roll forming of steel as well as its further processing and various services. Our products are innovative tube and section solutions, as well as welded assemblies consisting of them, which are all formed, further processed and welded at our site in Krems (Austria).
For the use of the product, the respective national regulations at the place of use apply, for example, in Germany, the building regulations of the federal states, and the technical specifications based on these regulations

2.2 Application

voestalpine Krems GmbH offers customized solutions for every area of application with technology and material expertise. Our tubes, sections, and welded assemblies made from them in defined steel grades and dimensions are used in demanding areas such as agricultural machinery, bus, and crane construction. Also, products for horticulture and viticulture, as well as individual tube and section solutions for the energy sector, storage and conveyor technology, the health & supply industry, the environmental & recycling industry, the construction industry, as well as for construction machinery and forklifts, are part of our wide range of offerings. The development of innovative assembly solutions is one of our core competencies.
Some application examples from vehicle construction are front, rear, and side impact protection, sills, bumpers, window guide rails, loading area frames, lashing rails, axle carriers and axle constructions, cross members, instrument carriers, towing devices, door impact systems, and space frame structures.
Application examples from agricultural and construction machinery are chain guides, door frames, loading area frames, safety cabins (ROPS, FOPS), or safety frames. Application examples from lifting technology are crane components, lift platform construction and lifting arms.
Fastening technology, bridge railings, anchor rails, partitions, ceiling rails, and guide rails are application examples from the construction industry.
Products for formwork construction are frame tubes/sections, cross tubes/sections, and anchoring tubes/sections.
Application examples in container construction are floor frames, roof frames, and corner posts.
Application examples from the material handling sector are high bars, pallet carriers, sliding rails, side plates, diagonals, support angles, running rails, and guide sections.
In the energy sector tubes and sections for free-field systems, solar trackers, rooftop systems, self-supporting canopies, back rails for thin-film modules, and elements for solar power plant construction are offered.

2.3 Technical Data

Various standards are applied during the roll forming of steel strips into sections or tubes, as well as during their further processing.

Structural data

Name	Value	Unit
Density	7850	kg/m^3
Modulus of elasticity	210000	N/mm^2
Melting point	1536	°C
Electrical conductivity at 20°C	1E+07	$\Omega^{-1}m^{-1}$
Minimum yield strength (für Bleche)	235	N/mm^2
Minimum tensile strength (für Bleche)	360	N/mm^2
Minimum elongation (für Bleche)	4	%

Performance values of the product according to the performance declaration under the CPR with regard to its essential characteristics according to *EN1090-1*, *EN 10025-1*, *EN 10219-1*, customer-specific product standards, and an internal factory standard.

2.4 Delivery status

Our products are delivered in customer-specific bundles as efficiently as possible. Boxing patterns and packaging materials are optimized for the means of transport and customer requirements. The products are delivered either with wooden slats and strapping bands or in reusable load carriers.

The smallest square tubes that can be manufactured measure 15 x 15 mm with a minimum wall thickness of 1.2 mm and a minimum length of 4.0 metres. At the other end of the spectrum is the largest square tube with dimensions of 220 x 220 mm, a maximum wall thickness of 10 mm and a length of up to 18 metres. In addition, the production range includes numerous rectangular tubes with a circumference of up to 858 mm, corresponding to the maximum steel strip width that can be processed.

In addition to square and rectangular cross-sections, the special tube mill also produces closed cross-sections that differ from squares or rectangles. The range extends from minimum wall thicknesses of 0.5 mm to maximum wall thicknesses of 6 mm and steel strip widths of up to 670 mm.

In addition to closed, welded cross-sections, open cross-section shapes, known as profiles, are also produced. These can have wall thicknesses ranging from 0.5 mm to 8 mm and a maximum strip width of 600 mm. Square and rectangular tubes, as well as special tubes and special profiles, can be delivered to the customer either as ready-to-install products or as semi-finished products. In many cases, these products are also used as semi-finished products in further processing within the factory. This results in bent parts, laser parts and welded assemblies. Due to the wide variety of shapes, material thicknesses and sizes, the declared unit is defined as one tonne of average tubes, profiles or welded assemblies.

2.5 Base materials/Ancillary materials

The tubes and sections are made 100% from steel. Coils are used as the starting material. Various auxiliary materials such as gases, lubricants, oils, welding wire, and tools are used in production. We take measures to ensure that our products have as few residues as possible.

The product/item/at least one partial product contains substances from the *ECHA list* of substances of very high concern (SVHC) (21.01.2025) above 0.1% by mass: **no**.

The product/item/at least one partial product contains other carcinogenic, mutagenic, reprotoxic (CMR) substances of category 1A or 1B that are not on the candidate list, above 0.1% by mass in at least one partial product: **no**.

The present construction product has been treated with biocidal products or has been treated with biocidal products (thus it is a treated article within the meaning of the *Biocidal Products Regulation (EU) No. 528/2012*): **no**.

2.6 Manufacture

The delivered coils are longitudinally slit and coiled again into rings at our slitting line. Then the rings are formed into tubes or sections through roll forming lines. Over several stations, the initially flat steel strip is gradually shaped by pairs of rolls in the tool frames. In the production process of tubes, the meeting steel strip edges are welded together along the entire length. If desired, the tubes can be further processed by bending, welding, or laser cutting into ready-to-install components. This way, our facilities produce customized tubes, sections, and welded assemblies for individual solutions. Quality is ensured through the quality management standards *ISO 9001*, *IATF 16949*, and in-house production control.

2.7 Environment and health during manufacturing

voestalpine Krems GmbH is certified according to *ISO 14001*, *ISO 45001*, and *ISO 50001*. There is a divisional CO_2 reduction program. Energy and material flows are recorded, evaluated, and optimized. There is hazardous substance management. Where possible, hazardous substances are substituted with less problematic alternatives. Health protection measures are developed and continuously implemented.

2.8 Product processing/Installation

Our tubes, sections and welded assemblies consisting of them are incorporated by our customers into various products, machines or vehicles.

2.9 Packaging

Our products are packaged as resource-efficiently as possible according to customer specifications. Wooden slats, pallets, strapping bands, and, if necessary, VCI films are used for overseas transport.

2.10 Condition of use

During the usage phase of the declared products, no material changes are expected.

2.11 Environment and health during use

A negative impact on health, environment, groundwater and air, as well as noise generation, is not expected during the usage phase of the tubes, sections and welded assemblies.

2.12 Reference service life

The reference service life is highly dependent on the area of application. Depending on the type of use and location, it can range between 10 and 50 years.

2.13 Extraordinary effects

Fire

Steel tubes are non-flammable. No combustible gases or vapors are released.

Fire protection

Name	Value
Building material class	A1
Burning droplets	n.a.
Smoke gas development	n.a.

n.a. not applicable

Water

No negative environmental impacts are expected under the influence of water.

Mechanical destruction

Unforeseeable mechanical impacts on the product have no negative consequences for the environment due to the base material.

2.14 Re-use phase

The declared products can be materially recycled and reintroduced into the steel industry as secondary raw material through recycling companies.

2.15 Disposal

The declared product can be fully used as recycling material. The waste code according to the *European Waste Catalogue* is: 17 04 05.

2.16 Further information

Further information about our products can be found on the website at the following link:https://www.voestalpine.com/krems/en/Products

3. LCA: Calculation rules

3.1 Declared Unit

This Environmental Product Declaration refers to a declared unit of 1 ton of tubes, sections, and welded assemblies consisting of them, produced by voestalpine Krems GmbH, declared as an annual average.

Declared Unit

Name	Value	Unit
Declared unit	1	t

Sections, tubes and welded assemblies made from them are produced from hot-rolled, cold-rolled, hot-dip galvanized or, in exceptional cases, coated steel coils and formed into a wide variety of geometries. The declared results refer to a weighted average of the entire product group. The different primary materials lead to a certain variation of results. An analysis of the deviation due to the different coil inputs was carried out in the reference year. In relation to the total GWP, this analysis shows a deviation of < 10 % for the various steel coils. This means that the declaration of an average product is considered representative of the entire voestalpine Krems product range.

3.2 System boundary

The life cycle assessment of average sections, tubes, and welded assemblies made from them refers to a cradle-to-gate analysis of the environmental impacts with modules C1–C4 and module D (A1–A3 + C + D). The following life cycle phases are taken into consideration in the analysis:

Modul A1-A3 | Production stage

The production stage includes the expenses for the production of the raw materials used (steel input material), the transportation of the raw materials and the environmental expenses from production at the Krems site (Austria). Scrap used in the manufacture of primary products is included in the calculation burden-free.

Energy is provided at the site via the plant's own PV system (GWP-total = 0.029 kg CO_2-equ./kWh), electrical energy from the grid using 100 % green electricity (GWP-total = 0.0083 kg CO_2-equ./kWh) and natural gas.
The packaging of the products is taken into account in accordance with the manufacturer's specifications.

Modul C1 | Deconstruction and demolition
It is assumed that the product is not connected with other materials and can therefore be dismantled. Due to a large variety of applications of the declared products, it is not possible to define a representative scenario for module C1. Deconstruction can happen manually or with the help of suitable tools. Relative to the environmental burden of module A1-A3, the associated efforts are to be expected as negligible. No environmental impacts from the deconstruction of the products are declared.

Modul C2 | Transport to disposal
Module C2 includes the transport to disposal. For this purpose, transport by truck over a distance of 50 km is assumed as a scenario.

Modul C3 | Waste processing
Product flows that reach Module D for recycling leave the product system in C3. Environmental impacts resulting from the grinding and sorting of steel scrap are not included due to the negligible expected environmental impact.

Modul C4 | Landfilling
Module C4 declares the environmental impacts incurred by landfilling (5 % of the product).

Modul D | Benefits and loads beyond the system boundary
The potential for substituting primary steel with a recycling scenario (95 % of the product) is contained in Module D.

3.3 Estimates and assumptions

Assumptions and approximations are applied in case of a lack of representative data. All assumptions are supported by detailed documentation and correspond to the best possible representation of reality with regard to the available database.

3.4 Cut-off criteria

The LCA model covers all available input and output flows, which can be represented based on robust data and from which a significant contribution can be expected. Data gaps are filled with conservative assumptions of average data or generic data if available and are documented accordingly. Only data with a contribution of less than 1 % were cut off. Thus, no data were neglected, of which a substantial impact is to be expected. All relevant data were collected comprehensively. Cut-off material and energy flows were chosen carefully based on their expected quantitative contribution as well as potential environmental impacts. Thus, it can be assumed that the sum of all neglected input flows does not account for more than 5 % of the total material, water and energy flows.

3.5 Background data

Primary and secondary data are used for the evaluation of upstream environmental impacts in the LCA model. Product-specific environmental product declarations are available for mapping the upstream supply chain of some of the steel coils used. Secondary data is taken from the *MLC 2024.2* background database (e.g. worldsteel industry averages).

3.6 Data quality

The data is collected using data collection forms specifically adapted to the sector. It follows an iterative process of clarifying questions via email, telephone calls or in personal/web meetings. Intensive discussions between voestalpine Krems GmbH and Daxner & Merl result in an accurate mapping of product-related material and energy flows. This leads to a high quality of foreground data collected. Data collection relies on a consistent process according to *ISO 14044*.

The technological, geographical and time-related representativeness of the database was kept in mind when selecting background data. Whenever specific data were missing, either generic datasets or representative average data were used instead. The implemented *MLC* background datasets are not older than 10 years.

The life cycle assessment of the declared products is significantly influenced by the purchase of pre-materials. In order to ensure the highest possible representativeness of the results, supplier-specific EPDs and regionalized industry data were used if available.

3.7 Period under review

Foreground data of voestalpine Krems GmbH were collected in the fiscal year 2023/2024 (01.04.2023-31.03.2024), and the data are based on the volumes produced on an annual basis.

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Austria

3.9 Allocation

Background data on the steel supply chain is published by worldsteel. In the absence of supplier-specific data, certain quantities of input material used are mapped using worldsteel industry averages. As these represent an average of the global steel industry, the worldsteel background datasets ensure good geographical and technological representativeness of steel production. All worldsteel datasets are modelled according to the worldsteel LCA methodology (*worldsteel, 2019*), which uses the system extension approach for the allocation of steel production co-products. Therefore, these data sets do not fully comply with the requirements of *EN 15804+A2*, which requires the so-called partitioning approach in which the environmental impacts are divided based on physical or economic relationships. Due to the lack of data based on an *EN15804*-compliant approach, the worldsteel data represent the most accurate depiction of steel production in this context. Scrap input is included in the calculation burden-free. To calculate the net flows, the mass used in production as external steel scrap is deducted from the total mass of the product.

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. The *MLC 2024.2* background database in the *LCA FE*-software version 10.9 was used to calculate the LCA.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The declared product does not contain biogenic carbon

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	3.4	kg C

The carbon stored in the packaging was taken into account as 'CO_2-neutral'. This means that the storage effect of the carbon bound in the packaging is not included in the calculation, but is considered to be theoretically emitted immediately.

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Installation into the building (A5)

The end-of-life of the packaging materials is not declared in module A5, but is documented as technical scenario information in the following table.

Name	Value	Unit
Packaging (pallets/wood)	7.61	kg
Packaging (steel plates)	0.81	kg

End-of-life (C1-C4)

Name	Value	Unit
Collected separately waste type (steel)	1000	kg
Recycling (95 %)	950	kg
Landfilling (5 %)	50	kg

Re-Use, recovery and recycling potential (D), relevant scenario information

Name	Value	Unit
Net flow	894	kg

This scenario contains a recycling rate of 95 %. As steel scrap is purchased in the upstream supply chain for the production of the purchased tubes, this is offset against the steel scrap for recycling ('net flow').

5. LCA: Results

The following table contains the LCA results (Environmental impact assessment in accordance with EF 3.1) for a declared unit of 1 tonne of average sections, tubes, and welded assemblies made from them.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = 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	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 t sections, tubes and welded assemblies made from them

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	2.51E+03	0	3.65E+00	0	1.04E+00	-1.54E+03
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	2.51E+03	0	3.6E+00	0	1.04E+00	-1.55E+03
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	3.79E+00	0	8.24E-03	0	3.48E-03	9.16E+00
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	6.88E-01	0	3.37E-02	0	4.53E-03	-2.07E-01
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	3.26E-09	0	4.74E-13	0	3.24E-12	2.09E-09
Acidification potential of land and water (AP)	mol H^+ eq	5.97E+00	0	1.29E-02	0	6.49E-03	-3.8E+00
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	1.91E-03	0	1.33E-05	0	2.11E-06	-3.62E-04
Eutrophication potential aquatic marine (EP-marine)	kg N eq	1.24E+00	0	5.93E-03	0	1.57E-03	-6.11E-01
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	1.3E+01	0	6.65E-02	0	1.73E-02	-5.47E+00
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	4.33E+00	0	1.17E-02	0	4.94E-03	-2.48E+00
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	8.12E-03	0	2.41E-07	0	6.98E-08	-8.8E-03
Abiotic depletion potential for fossil resources (ADPF)	MJ	2.44E+04	0	4.98E+01	0	1.73E+01	-1.54E+04
Water use (WDP)	m^3 world eq deprived	1.37E+02	0	4.4E-02	0	1.27E-01	-1.05E+02

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 t sections, tubes and welded assemblies made from them

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	2.16E+03	0	3.61E+00	0	2.56E+00	6.1E+02
Renewable primary energy resources as material utilization (PERM)	MJ	1.26E+02	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	2.29E+03	0	3.61E+00	0	2.56E+00	6.1E+02
Non renewable primary energy as energy carrier (PENRE)	MJ	2.44E+04	0	4.98E+01	0	1.73E+01	-1.54E+04
Non renewable primary energy as material utilization (PENRM)	MJ	0	0	0	0	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	2.44E+04	0	4.98E+01	0	1.73E+01	-1.54E+04
Use of secondary material (SM)	kg	1.7E+02	0	0	0	0	8.94E+02
Use of renewable secondary fuels (RSF)	MJ	0	0	0	0	0	0
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	0
Use of net fresh water (FW)	m^3	9.99E+01	0	3.95E-03	0	3.85E-03	-1.57E+02

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 t sections, tubes and welded assemblies made from them

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	3.05E-02	0	1.54E-10	0	4.11E-09	-1.16E-04
Non hazardous waste disposed (NHWD)	kg	6.32E+01	0	7.59E-03	0	5.01E+01	1.87E+02
Radioactive waste disposed (RWD)	kg	1.08E-01	0	9.32E-05	0	2.34E-04	1.69E-03
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	0	0	0	9.5E+02	0	0
Materials for energy recovery (MER)	kg	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	0	0	0	0	0	0
Exported thermal energy (EET)	MJ	0	0	0	0	0	0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 t sections, tubes and welded assemblies made from them

Parameter	Unit	A1-A3	C1	C2	C3	C4	D

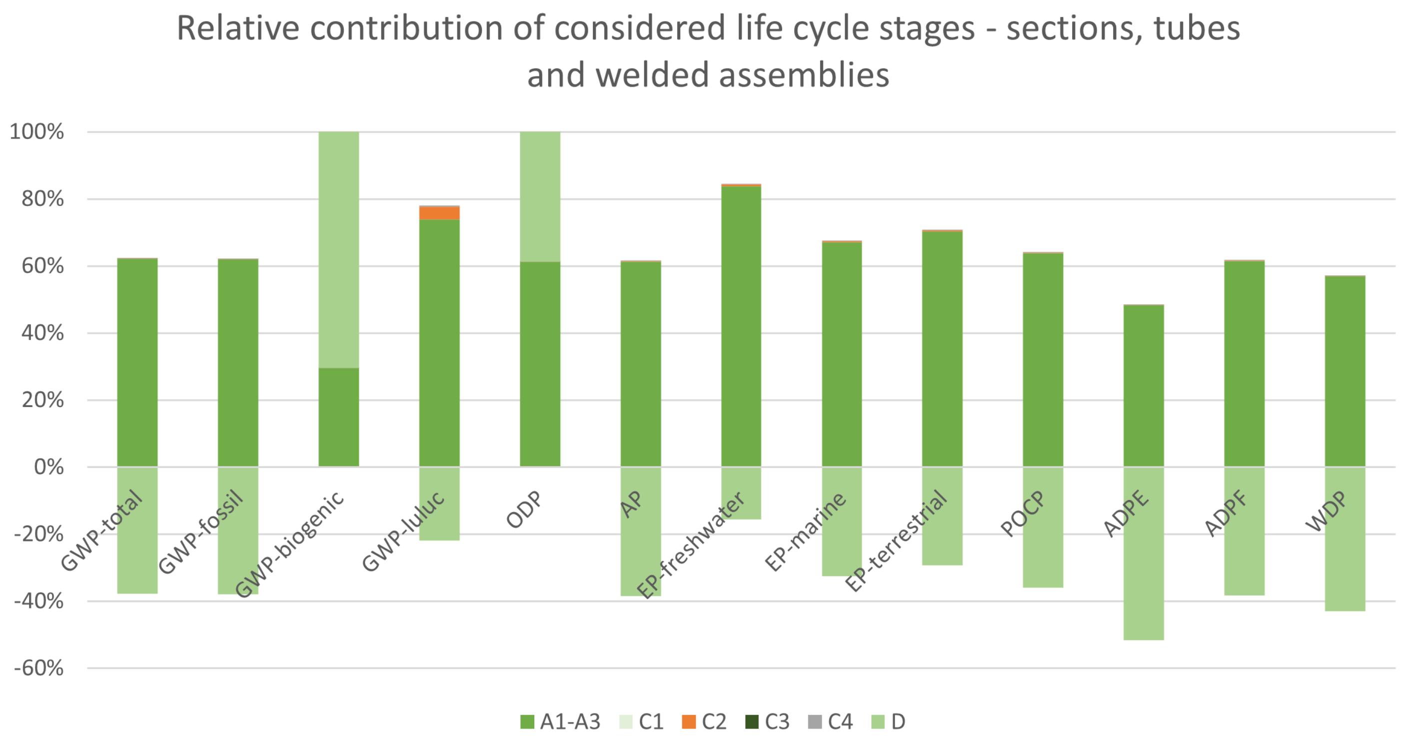
Incidence of disease due to PM emissions (PM)	Disease incidence	ND	ND	ND	ND	ND	ND
Human exposure efficiency relative to U235 (IR)	kBq U235 eq	ND	ND	ND	ND	ND	ND
Comparative toxic unit for ecosystems (ETP-fw)	CTUe	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	ND	ND	ND	ND	ND	ND
Soil quality index (SQP)	SQP	ND	ND	ND	ND	ND	ND

The additional and optional impact categories according to *EN 15804+A2* are not declared, as the uncertainty of these indicators is to be classified as high.

Disclaimer – for the indicators 'abiotic depletion potential for non-fossil resources', 'abiotic depletion potential for fossil resources', 'water (user) deprivation potential, deprivation-weighted water consumption'.
The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

6. LCA: Interpretation

The following interpretation contains a summary of the LCA results referenced to a declared unit of 1 tonne of average sections, tubes, and welded assemblies made from them.



A comparison of the individual life-cycle phases results in a clear dominance of the production phase (Modules A1–A3). The environmental effects in the production phase are mainly dominated by the supply chain of the purchased steel input material.

As a result of product recyclability, the material removed at the end-of-life can substitute primary steel. Module D shows the recycling potential of steel at the end of its product life. This results in benefits from the substitution of primary steel.
The environmental impact of the transport of the products to recycling (C2) as well as landfilling of the losses at the end of life (C4) represents a minor contribution to the overall environmental impact of the product.

In summary, the upstream environmental impacts from the upstream chain of the steel coils can be identified as key factors in the LCA. These are mapped as best as possible using supplier-specific data. It can be assumed that the results are highly representative.

The declared results refer to an annual average of sections, tubes and welded assemblies manufactured from them. The use of different primary materials can lead to differences in the results of individual products. An analysis of the range of environmental impacts resulting from differences in the sourced raw materials shows a variation of results of less than 10 % with respect to the global warming potential (GWP-total). The analysis shows that the results for products made from hot-rolled and cold-rolled steel plates are slightly overestimated on average. Sections, tubes and welded assemblies made exclusively from hot-dip galvanized strip are underestimated by around 10 % on average. The declared average can therefore be classified as representative of the entire voestalpine Krems product range.

7. Requisite evidence

Not relevant for this EPD.

8. References

EN 10025-1
EN 10025-1:2004, Hot rolled products of structural steels.

EN 10219-1
EN 10219-1:2006, Cold-formed welded structural hollow sections of non-alloy and fine-grain steels.

EN 1090-1 EN
1090-1:2009, Execution of steel structures and aluminium structures – Part 1: Requirements for conformity assessment of structural components.

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

IATF 16949
IATF 16949:2016, Quality management systems – Particular requirements for the application of ISO 9001:2015 for automotive production and relevant service parts organizations.

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

ISO 14025
EN ISO 14025:2011, Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

ISO 14044
EN ISO 14044:2006-10, Environmental management – Life cycle assessment – Requirements and guidelines.

ISO 45001
ISO 45001:2018, Occupational health and safety management systems – Requirements with guidance for use.

ISO 50001
ISO 50001:2018, Energy management systems – Requirements with guidance for use.

ISO 9001
ISO 9001:2015, Quality management systems – Requirements.

Further Literature

ECHA-Candidate List
List of Substances of Very High Concern (SVHC) for Authorization dated 21.01.2025, published in accordance with Article 59 (10) of the REACH Regulation. European Chemicals Agency.

European Waste Catalogue
European Commission. Commission Decision 2000/532/EC of 3 May 2000 establishing a list of wastes. Official Journal of the European Communities L 226, 6 September 2000: 3–24

IBU 2021
Institut Bauen und Umwelt e.V.: General guidance for the EPD program of the Institut Bauen und Umwelt e.V. (IBU). Version 2.0, Berlin: Institut Bauen undUmwelt e.V., 2021. www.ibu-epd.com

JRC 2022
European Commission-Joint Research Centre, 2022. Environmental Footprint reference package, EF reference package 3.1.

LCA FE
LCA FE 10, LCA for Experts Software System and Database for Life Cycle Engineering. Version 10.9. Sphera, 1992-2025.

MLC
MLC 2024.2, Database for Life Cycle Engineering implemented in LCA for Experts software system. DB v10.9 2024.2. Sphera, 1992-2025. Available at: https://lcadatabase.sphera.com/.

Ordinance on Biocide Products
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