# 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-20240516-IBC1-EN |
| Issue date | 22.11.2024 |
| Valid to | 21.11.2029 |

## voestalpine rails (update)

## voestalpine Rail Technology GmbH

www.ibu-epd.com | https://epd-online.com

voestalpine
ONE STEP AHEAD.

# 1. General Information

## voestalpine Rail Technology GmbH

**Programme holder**

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

**Declaration number**

EPD-VOE-20240516-IBC1-EN

**This declaration is based on the product category rules:**

Rails forming a track for vehicles, 01.08.2021
(PCR checked and approved by the SVR)

**Issue date**

22.11.2024

**Valid to**

21.11.2029

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

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

## voestalpine rails (update)

**Owner of the declaration**

voestalpine AG
voestalpine-Straße 3
4020 Linz
Austria

**Declared product / declared unit**

1 metric ton of average voestalpine rail

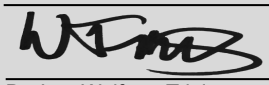
**Scope:**

This EPD is based on a declared unit of 1 metric ton of average voestalpine rails produced at the production site in Donawitz (Austria). The considered products are naturally hardened or heat treated (head hardened) rails.
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.-Ing. Wolfram Trinius,
(Independent verifier)

# 2. Product

## 2.1 Product description/Product definition

The products of voestalpine Rail Technology GmbH are manufactured and delivered as roughly 130 different profiles and grades pursuant to applicable European and international standards, guidelines and specifications. The company is the manufacturer with the largest variety of rail profiles and grades worldwide. For the use and application of the product the respective national provisions at the place of use apply.

## 2.2 Application

The products of voestalpine Rail Technology GmbH are used in railway systems, particularly in the following areas:

- High-speed railways
- Mixed railways (passenger and freight traffic)
- Heavy loads (including railways for ore transports)
- Urban public transportation (subways and trams)
- Railway switches (individual parts used in switch production)

## 2.3 Technical Data

This EPD refers to all products of voestalpine Rail Technology GmbH in a variety of different steel grades, dimensions, shapes and as-delivered conditions.

**Constructional data**

| Name | Value | Unit |
|---|---|---|
| Density | 7874 | kg/m$^3$ |
| Tensile strength in accordance with TSI | >680 | N/mm$^2$ |
| Hardness in accordance with TSI | >200 | HBW |
| Elongation in accordance with EN 13674 and EN 14811 | >9 | % |

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision (no CE-marking).

## 2.4 Delivery status

The products of voestalpine Rail Technology GmbH are supplied in various profiles and customer-specified lengths of up to 120 meters. Customer supply can be just in time for every tariff station in Europe.

## 2.5 Base materials/Ancillary materials

The products of voestalpine Rail Technology GmbH are made from of 100% continuously cast blooms (roughly 80% crude steel, 20% scrap and alloying elements) produced by voestalpine Stahl GmbH. The precise composition of the steel depends on the application and the steel grade specified by the customer.

The product contains substances in the Europaeische Chemikalien Agentur *(ECHA) candidate list* (27 June 2024) above 0.1 mass %: no.

The product contains further carcinogenic, mutagenic, reprotoxic (CMR) substances of category 1A or 1B that are not in the *candidate list*, above 0.1 mass % in at least one sub-product: no.

Biocides have been added to the construction product, or the product has been treated with biocides (a treated product pursuant to the Biocidal Product Regulation (EU) No. 528/2012): no.

## 2.6 Manufacture

The starting material for the production of rails at voestalpine is crude steel made in the primary route (blast furnace, LD steelmaking plant) at the Donawitz site. The molten crude steel is cast into blooms using a continuous casting method. The blooms are temporarily stored in the bloom storage unit or in a holding pit and heated to rolling temperature in a controlled manner in the walking beam furnace. The rails are then pre-rolled in the reversing break-down mill (BDM). Final shaping of the rails takes place in the ultra-flexible rail mill (UFR). Depending on customer specifications, the rails are cooled naturally or heat-treated to achieve desired properties.

As a rail manufacturer with the largest variety of profiles and grades in the world, this results in a mode of operation that is not directly comparable with other more standardized production routes. The high number of rollers and conversions in the production flow also mean a specifically higher energy demand.

Further production stages:

- Vertical and horizontal straightening
- Non-destructive testing (visual testing, flatness testing, eddy current testing and ultrasonic testing)
- Final straightening
- Cutting
- Drilling
- Final acceptance
- Storage and shipping

## 2.7 Environment and health during manufacturing

The production site of voestalpine Rail Technology GmbH is certified pursuant to eco-management and audit scheme *EMAS 2009*, *ISO 9001*, *ISO 14001*, *ISO 50001* and occupational health and safety assessment series *ISO 45001*. In compliance with EMAS provisions, voestalpine continually publishes environment-related facts and figures pertaining to the production site. At the Donawitz site, investments are made on a regular basis in an effort to expand the environmental protection measures to reduce air and water emissions to a minimum. Compliance with all statutory emission limit values has been verified. All production systems approved in accordance with applicable environmental impact analyses are also inspected on a regular basis as part of environmental audits. voestalpine was the first steelmaking company to be awarded the Green Bands seal of approval for special commitment in the areas of global environmental protection and sustainability.

## 2.8 Product processing/Installation

The products of voestalpine Rail Technology GmbH are processed directly at the site of installation and in special welding plants in the region where they are to be used in the future. Installation is carried out in accordance with the applicable standards and directives in the respective place of use.

### 2.9 Packaging
The products of voestalpine Rail Technology GmbH are delivered unpacked to the customer (fastened for transport with Signode or steel straps).

### 2.10 Condition of use
No changes to the material grade are expected while the rails are in use. Maintenance and inspection requirements are dependent on the material design and the respective place of application.

### 2.11 Environment and health during use
No effects to the health of humans or animals, nor harmful air, soil or water emissions are expected during the use of rails.

### 2.12 Reference service life
With respect to rail products made by voestalpine Rail Technology GmbH, the specification of a reference service life is waived based on the variety of applications and stress (high-speed traffic, mixed traffic, heavy loads, passenger traffic, urban traffic, switch technologies). The service life of rails is affected by the installation radius and track conditions. The service life of the product is optimized by regular maintenance performed by the end user. Proper selection of the product can significantly increase the service life of rails.

### 2.13 Extraordinary effects
**Fire**
Rails are not flammable. No flammable gases or vapors are released.

**Fire protection**

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

n.a. = not applicable

**Water**
No negative effects on the environment are expected from water (including flooding).

**Mechanical destruction**
Unforeseeable mechanical effects on the declared product would have no environmental impact because of the plasticity of steel.

### 2.14 Re-use phase
The declared products consist of 100% steel and can thus either be reused or used as a valuable secondary raw material in the steelmaking industry. Steel is a permanent material that can be recycled as many times as necessary.

### 2.15 Disposal
The declared product can be entirely recycled. The waste code is in accordance with the *European Waste Catalogue (EWC)*: 17 04 05 (iron and steel). The type of waste is to be equated with the waste catalogue code 35103 pursuant to the Waste Catalogue Ordinance applicable in Austria.

### 2.16 Further information
Please find more information about the product on our homepage at https://www.voestalpine.com/railway-systems/en/locations/voestalpine-rail-technology/.

## 3. LCA: Calculation rules

### 3.1 Declared Unit
This environmental product declaration refers to a declared unit of 1 metric ton of average voestalpine rail.

**Declared unit**

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | t |
| Conversion factor to 1 kg | 0.001 | - |

Other declared units are allowed if the conversion is shown transparently.

The analysed products represent naturally hardened and heat treated rails and do not differentiate with respect to their basic composition. Depending on the client's specifications, the steel grade may vary. This EPD covers voestalpine rails referring to an average steel grade, which is considered representative for all voestalpine rail products.

### 3.2 System boundary
The life cycle assessment of voestalpine rails refers to a cradle-to-gate analysis with modules C1-C4 and module D (A1-A3 +C +D). The following lifecycle phases are taken into consideration in the analysis:

**Module A1-A3 | Production stage**
The production stage includes the efforts of the production process of voestalpine Railway Systems GmbH at the site in Donawitz. On site the rolling mill, heat treatment and the finishing processes are considered. Steel blooms are provided by the integrated steel mill at the site in Donawitz. The upstream burdens of steel production are, therefore, considered via primary data. Electricity is provided at Donawitz in a power station where furnace gases are used as fuel. Since more energy is used than is supplied by the site's power station, natural gas and electricity is additionally supplied from the Austrian grid.
No packaging is needed for the delivery of the product.

**Modul C1 | Destruction and demolition**
It is assumed that the product is not connected with other materials and can therefore be dismantled. Associated efforts are 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.

**Module C3 | Waste treatment**
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.

**Module C4 | Landfilling**
Module C4 declares the environmental impacts incurred by landfilling (1% of the product).

**Module D | Benefits and loads beyond the system boundary**
The potential for substituting primary steel with a recycling scenario (99% of the product) is set forth in Module D.

### 3.3 Estimates and assumptions
All assumptions are verified through detailed documentation and correspond to the best possible representation of reality based on the available data. Regional applicability of the used background data refers to average data under European or German conditions taken from the *MLC* database. German data was used for the Austrian market whenever European or Austrian average data were not available.

### 3.4 Cut-off criteria
All inputs and outputs for which data are available are included in the LCA model. Data gaps are filled with conservative assumptions from average data (when available) or with generic data and are documented accordingly. Only data with a contribution of less than 1% were cut off. Ignoring such data is justified based on the insignificance of the expected effect. Processes, materials or emissions known to make a significant contribution to the environmental effects of the products under examination have not been neglected. Plausibility of data collection was further checked based on industry benchmarks. Data have been completely recorded and the overall total of ignored input flows do not amount to more than 5% of total energy and mass flows.
Environmental impacts of machines, plant and infrastructure were not included.

### 3.5 Background data
Secondary data are used to depict the background system in the LCA model. These data originate from the *MLC* 2023.2 database in the *LCA FE*-software version 10.

### 3.6 Data quality
The foreground data collected at voestalpine Rail Technology GmbH is based on the quantities used and volumes produced annually. All process data were collected by voestalpine and are also part of the group's reporting to official agencies. Data on material and energy use originate from material-specific throughput measurements of various processes as well as from controlling. Data were collected in compliance with the established *worldsteel* approach complemented by supplementary process specific plausibility checks. 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 background datasets from the *MLC* database are not more than ten years old.

### 3.7 Period under review
Foreground data were collected in the fiscal year 2022/23 (01.04.2022 - 31.03.2023). All 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
Primary data are allocated using the partitioning approach developed by *worldsteel 2014* for calculating life cycle inventories of co-products in steel production, which is in line with the provisions of *EN 15804*. The so-called partitioning approach provides for the allocation of environmental effects to the steelmaking process and the emerging byproducts based on physical relations. Material-inherent flow properties are thus taken into account.
Economic allocation is not considered as referring byproducts and co-products are not directly tradable goods. Furthermore, long-term contracts for the sale of the byproducts exist, and the negotiated prices are therefore not subject to market dynamics. The process specific allocation of environmental impacts from electricity and steam production of the site's power plant is based on exergy.

### 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* 2023.2 database in the *LCA FE*-software version 10 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 any biogenic carbon. The product is delivered entirely unpacked.

The end-of-life scenario used in this LCA study is based on the following assumptions and thus complies with information on the common recycling rates for rail infastructure.

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

| Name | Value | Unit |
|---|---|---|
| Collected separately waste type (steel) | 1000 | kg |
| Recycling 99 % | 990 | kg |
| Landfilling 1 % | 10 | kg |

**Re-Use, recovery and recycling potential (D)**

| Name | Value | Unit |
|---|---|---|
| Net flow of steel scrap | 828 | kg |

This scenario contains a recycling rate of 99%. Since voestalpine externally purchases scrap for steel production, this is offset against the steel scrap for recycling (net flow).

## 5. LCA: Results

The following table contains the LCA results for a declared unit of 1 metric ton of average voestalpine rails.

**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 voestalpine Rail**

| Parameter | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| Global Warming Potential total (GWP-total) | kg $CO_2$ eq | 2.78E+03 | 0 | 3.65E+00 | 0 | 4.62E-01 | -1.43E+03 |
| Global Warming Potential fossil fuels (GWP-fossil) | kg $CO_2$ eq | 2.77E+03 | 0 | 3.6E+00 | 0 | 4.68E-01 | -1.44E+03 |
| Global Warming Potential biogenic (GWP-biogenic) | kg $CO_2$ eq | 6.34E+00 | 0 | 8.24E-03 | 0 | -5.79E-03 | 8.47E+00 |
| Global Warming Potential luluc (GWP-luluc) | kg $CO_2$ eq | 5.09E-01 | 0 | 3.37E-02 | 0 | 4.75E-04 | -1.91E-01 |
| Depletion potential of the stratospheric ozone layer (ODP) | kg CFC11 eq | 9.62E-09 | 0 | 4.74E-13 | 0 | 7.71E-13 | 1.93E-09 |
| Acidification potential of land and water (AP) | mol $H^+$ eq | 4.46E+00 | 0 | 1.29E-02 | 0 | 1.5E-03 | -3.52E+00 |
| Eutrophication potential aquatic freshwater (EP-freshwater) | kg P eq | 1.18E-02 | 0 | 1.33E-05 | 0 | 4.23E-07 | -3.35E-04 |
| Eutrophication potential aquatic marine (EP-marine) | kg N eq | 1.21E+00 | 0 | 5.93E-03 | 0 | 3.77E-04 | -5.65E-01 |
| Eutrophication potential terrestrial (EP-terrestrial) | mol N eq | 1.26E+01 | 0 | 6.65E-02 | 0 | 4.14E-03 | -5.06E+00 |
| Formation potential of tropospheric ozone photochemical oxidants (POCP) | kg NMVOC eq | 3.27E+00 | 0 | 1.17E-02 | 0 | 1.18E-03 | -2.29E+00 |
| Abiotic depletion potential for non fossil resources (ADPE) | kg Sb eq | 2.42E-02 | 0 | 2.41E-07 | 0 | 1.28E-08 | -8.14E-03 |
| Abiotic depletion potential for fossil resources (ADPF) | MJ | 2.43E+04 | 0 | 4.96E+01 | 0 | 6.99E+00 | -1.43E+04 |
| Water use (WDP) | $m^3$ world eq deprived | 5.75E+01 | 0 | 4.4E-02 | 0 | -6.35E-03 | -9.7E+01 |

**RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 t voestalpine Rail**

| Parameter | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| Renewable primary energy as energy carrier (PERE) | MJ | 1.65E+03 | 0 | 3.61E+00 | 0 | 6.28E-01 | 5.64E+02 |
| Renewable primary energy resources as material utilization (PERM) | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| Total use of renewable primary energy resources (PERT) | MJ | 1.65E+03 | 0 | 3.61E+00 | 0 | 6.28E-01 | 5.64E+02 |
| Non renewable primary energy as energy carrier (PENRE) | MJ | 2.44E+04 | 0 | 4.98E+01 | 0 | 6.99E+00 | -1.43E+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 | 6.99E+00 | -1.43E+04 |
| Use of secondary material (SM) | kg | 2.05E+02 | 0 | 0 | 0 | 0 | 8.28E+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) | $m^3$ | 9.44E+00 | 0 | 3.95E-03 | 0 | 7.87E-05 | -1.45E+02 |

**RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 t voestalpine Rail**

| Parameter | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| Hazardous waste disposed (HWD) | kg | 1.44E-06 | 0 | 1.54E-10 | 0 | 5.77E-10 | -1.07E-04 |
| Non hazardous waste disposed (NHWD) | kg | 5.38E+01 | 0 | 7.59E-03 | 0 | 1E+01 | 1.73E+02 |
| Radioactive waste disposed (RWD) | kg | 1.29E-01 | 0 | 9.32E-05 | 0 | 8.13E-05 | 1.57E-03 |
| Components for re-use (CRU) | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| Materials for recycling (MFR) | kg | 0 | 0 | 0 | 9.9E+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 voestalpine Rail**

| 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 |

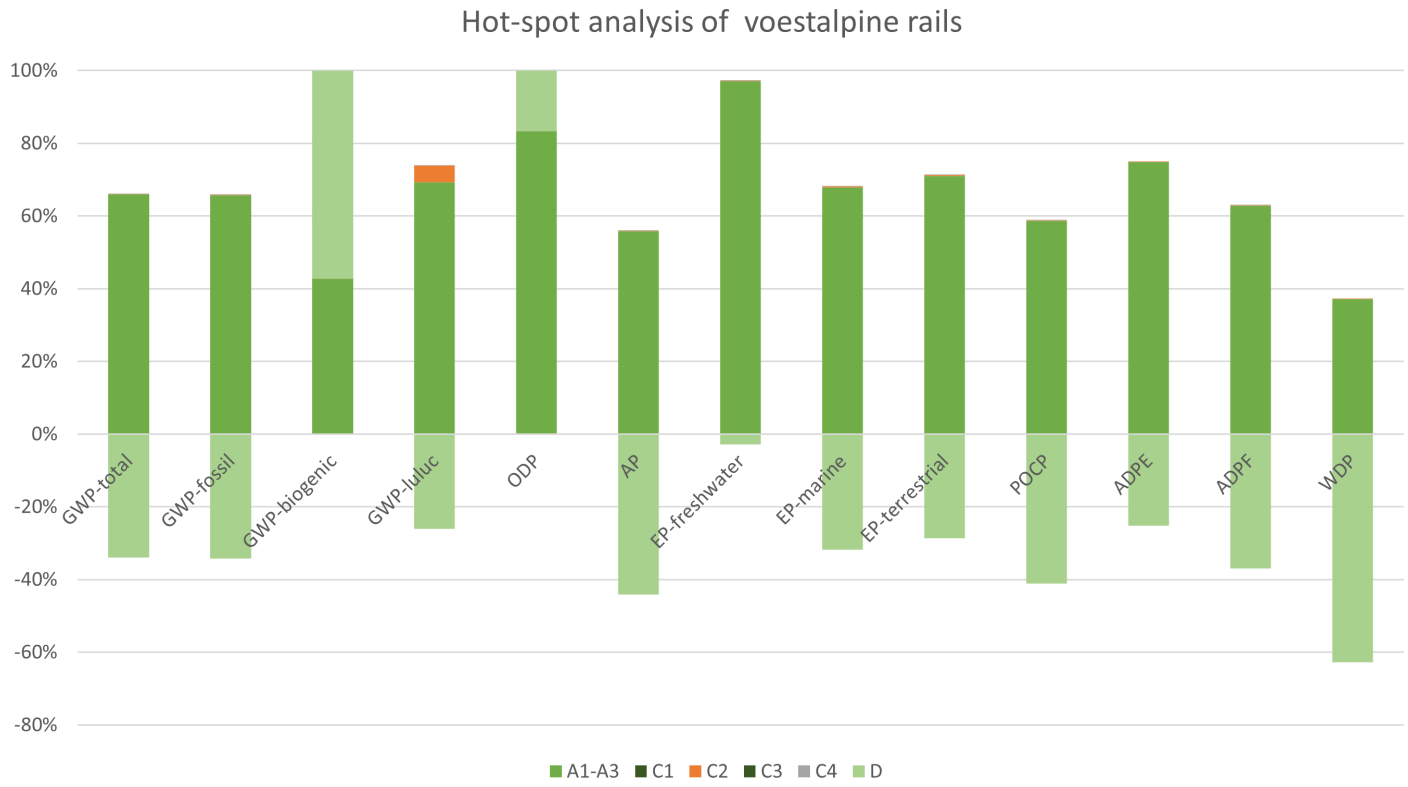
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Comparative toxic unit for ecosystems (ETP-fw) | CTUe | ND | ND | ND | ND | ND | ND |
| Comparative toxic unit for humans (carcinogenic) (HTP-c) | CTUh | ND | ND | ND | ND | ND | ND |
| Comparative toxic unit for humans (noncarcinogenic) (HTP-nc) | 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 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 metric ton of average voestalpine rail.




A comparison of the individual lifecycle 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 direct process emissions of steel production and the supply chain of purchased raw materials and energy carriers.

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. With the exception of the depletion potential of stratospheric ozone (**ODP**), this results in credits from the substitution of primary steel for the impact categories investigated. Environmental burdens from the electricity use for the EAF-process account for the ODP results. The environmental impacts of the transport to recycling (C2) and of landfill disposal (C4) represent a minor contribution to the overall environmental impact of the product.

Environmental impacts from the production phase of rails (**modules A1-A3**) can largely be attributed to the raw materials and energy carriers needed in the blast furnaces, the basic oxygen furnace and the sinter plant including their emissions for primary steel making.

The greenhouse gases directly emitted from these processes, especially the blast furnaces, as well as the energetic treatment of the metallurgical gases contribute to a large share of potential global warming (**GWP**). When it comes to raw material supply, the upstream environmental burden for the production of alloys and coke contribute a major part to the product's global warming potential. The potential global warming from further processing of blooms to rails is dominated by the emissions from natural gas used as energy carrier.

Looking at the rail production itself the main contribution to the global warming potential is due to the emissions from the use of natural gas. The global warming potential biogenic (**GWP-biogenic**) and the potential eutrophication freshwater ecosystems (**EP-freshwater**) are, further more, influenced by the electricity provision and the waste water treatment at site.

The declared average considers all produced grades of the product as a yearly average. The analysis of specific variants of products similar to the used steel bloom identified a variance of the carbon footprint below 10%. The rail production itself is based on the same processing steps for all products. Therefore, no additional variance results from it. The use of non fossil resources and the water scarcity depend highly on the

use of alloying elements in the production of the steel bloom. Hence, the variance of these indicators is higher depending on the product specifications.

Due to the homogeneous structure of the products their environmental impacts correlate directly with their mass.

## 7. Requisite evidence

Not relevant for this EPD.

## 8. References

**Standards**

**EN 13674**
DIN EN 13674-1:2017-07 Railway applications - Track - Rail - Part 1: Vignole railway rails 46 kg/m and above; German version EN 13674-1:2011+A1:201

**EN 14811**
DIN EN 14811:2019-06 Railway applications - Track - Special purpose rail - Grooved and associated construction profiles; German version EN 14811:2019

**EN 15804**
DIN EN 15804:201204+ A2:2019+AC:2021, Sustainability of construction works - Environmental Product Declarations - Corerules for the product category of construction products

**ISO 9001**
DIN EN ISO 9001:2015. Quality management systems - Requirements.

**ISO 14001**
DIN EN ISO 14001:2015. Environmental management systems - Requirements with guidance for use.

**ISO 14025**
DIN EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

**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.

**Further literature**

**ECHA Candidate List**
Candidate List of substances of very high concern for Authorisation (ECHA Candidate List), retrieved June 27, 2024, published in accordance with Article 59(10) of the REACH Regulation. Helsinki: European Chemicals Agency.

**EMAS 2009**
Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS).

**IBU 2021**
General instructions for the EPD program of Institut Bauen und Umwelt e.V. (IBU). Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021. www.ibuepd.com

**LCA FE**
LCA FE 10, LCA for Experts Software System and Database for Life Cycle Engineering. Version 10.7. Sphera, 1992-2023.

**MLC**
MLC 2023.2, Database for Life Cycle Engineering implemented in LCA for Experts software system. DB v10.7 2023.2. Sphera, 1992-2023. Available at: https://lcadatabase.sphera.com/

**PCR Teil A**
Institut Bauen und Umwelt e.V., 2022. Product category rules for building-related products and services. Part A: Calculation rules for the life cycle assessment and requirements on the project report according to En 15804-A3:2019. Version 1.3

**PCR: Rails forming a track for vehicles**
Institut Bauen und Umwelt e.V., 2024. Product category rules for building-related products and services. Part B: Requirements on the EPD for Rails forming a track for vehicles. Version 10. Berlin: 30.04.2024

**Waste List Ordinance**
BMLFUW 2003, Ordinance of the
Federal Minister of Agriculture and Forestry, Environment and Water Management (Federal Law Gazette II No. 570/2003) on a Waste List

**worldsteel 2014**
World Steel Association, 2014. A methodology to determine the LCI of steel industry co-products. 14th February 2014.

**Publisher**

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

**Programme holder**

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

**Author of the Life Cycle Assessment**

Daxner & Merl GmbH
Lindengasse 39/8
1070 Wien
Austria

0043 676 849477826
office@daxner-merl.com
www.daxner-merl.com

**Owner of the Declaration**

voestalpine AG
voestalpine-Straße 3
4020 Linz
Austria

+43/50304/15-0
info@voestalpine.com
www.voestalpine.com