

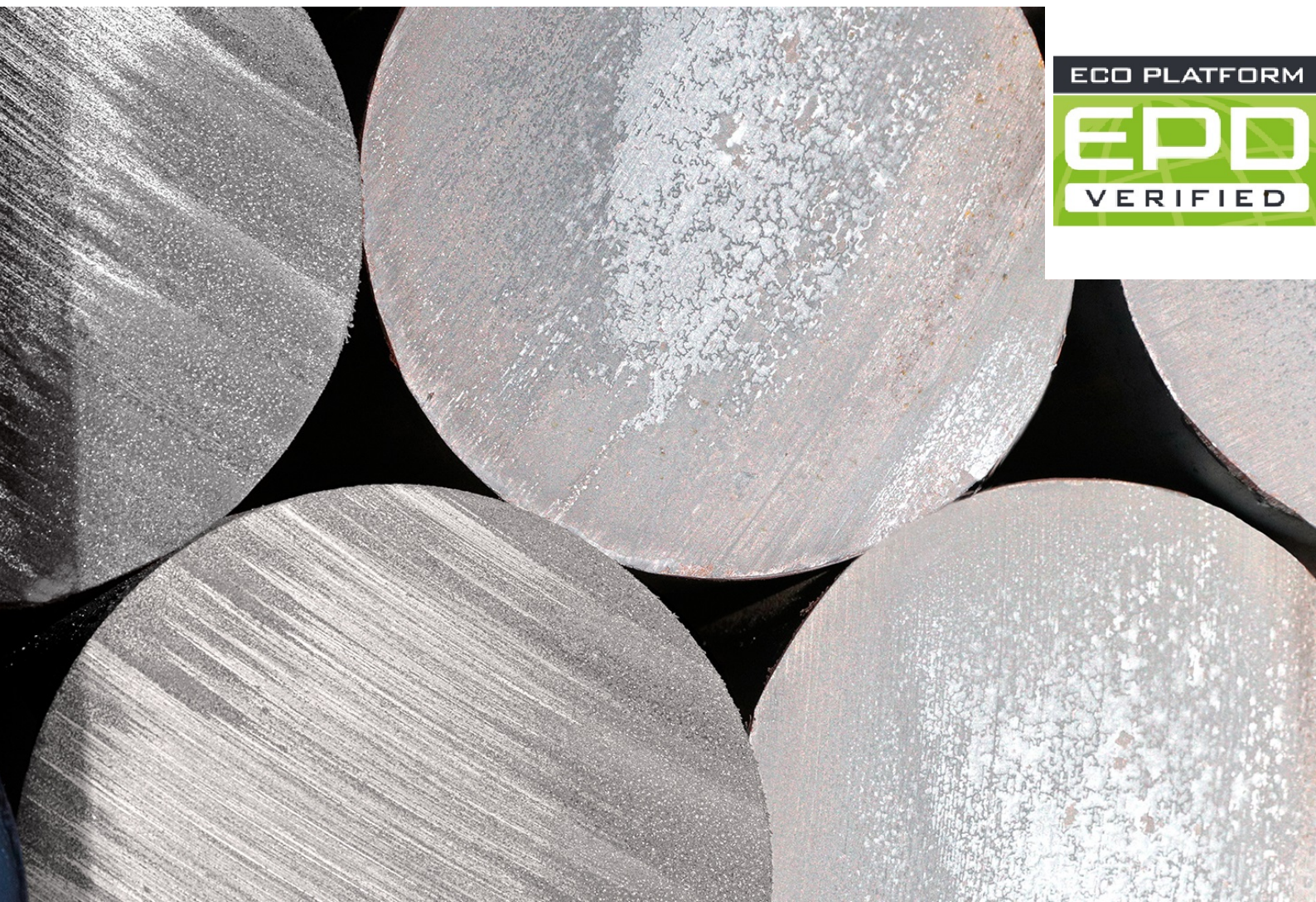
# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	Saarstahl AG
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SAS-20250295-CBC1-EN
Issue date	12.08.2025
Valid to	11.08.2030

**S-PURE+ Bar Steel**  
**Saarstahl AG**

[www.ibu-epd.com](http://www.ibu-epd.com) | <https://epd-online.com>



## General Information

### Saarstahl AG

#### Programme holder

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

#### Declaration number

EPD-SAS-20250295-CBC1-EN

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

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

#### Issue date

12.08.2025

#### Valid to

11.08.2030



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



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

### S-PURE+ Bar Steel

#### Owner of the declaration

Saarstahl AG  
 Bismarckstraße 57-59  
 66333 Völklingen  
 Germany

#### Declared product / declared unit

The declared unit is 1 metric ton of bar steel.

#### Scope:

The EPD declaration applies to 1 metric tonne of Wire Rod manufactured at Saarstahl Ascoval & the Saarstahl AG hot rolling mills.

The "S-Pure+" Bar Steel are high-quality products produced via secondary steelmaking. Saarstahl Ascoval located in St. Saulves (France) is a subsidiary of the Saarstahl group specialised in bloom production from recycled steel scrap.

The LCA does represent 100% EAF pre-material based bloom within the reference year of 2023.

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	
<input type="checkbox"/>	internally
<input checked="" type="checkbox"/>	externally



Dr. Niels Jungbluth,  
 (Independent verifier)



## Product

### Product description/Product definition

The S-PURE+ Bar Steel is a high-quality product of Saarstahl based on EAF pre-material, melted at Saarstahl Ascoval and hot rolled at the rolling mills of Saarstahl.

Bar steel is available in the formats round (15.0 – 181.0 mm), square (14.0 – 104.0 mm), hexagonal (14.0 – 88.0 mm) and flat (16.0 – 200.0 x 8.0 – 87.0 mm). The steel types include special steels, cold heading grades, free cutting steels, gauze wire, soft drawing grades, welding wire, prestressing steels, and rope wire. In the steelmaking process we offer Mechanical Soft Reduction (MSR) for improved material properties. In the rolling process the Kocks block (RSB) ensures excellent dimensional accuracy and tight tolerances. For the use and application of the product the respective national provisions at the place of use apply, in Germany for example the building codes of the federal states and the corresponding national specifications.

### Application

Saarstahls bar steel products are utilised in a wide range of applications. Products for construction are one of Saarstahl's core business fields. Bar steel is used for anchoring systems that are applied in the construction of facades, stadiums, port facilities and wind turbines or special solutions for stadium construction – Saarstahl is used in many construction projects. In the automotive sector our steels are used where the requirements in quality and safety are highest: in engine and gear components, in fuel injection systems, in tires, springs or connecting elements. We produce high-quality free cutting steels for discerning customers in the automotive and mechanical engineering sectors worldwide. Free cutting steel is used as an input material for drawing, peeling and lathe turning. Our range of grades includes wire rod and bar steel for soft free cutting steel, quenched and tempered free cutting steel and case hardening free cutting steel. SBQ are used for crankshafts, wheel hubs, connecting rods, drive shafts, rotor shafts for electric drives, axles / steering knuckles and pistons / piston pins.

The mechanical engineering sector comprises among other things, challenging product development projects for hydraulic components subjected to high stresses that must function reliably under enormous pressures. This includes bearing steels for anti-friction bearing rings, rolling elements, cams and wheel bearing flanges as well as SBQ and cold heading grades.

Further information can be found on the Saarstahl website.

### Technical Data

Bar steel in formats round, square, hexagonal, flat and wide-steel bars made from structural steel are defined by the harmonised standard EN 10025-1:2004 called: Hot rolled products of structural steels, Part 1: General technical delivery conditions.

The steel grades in general are defined by EN 10025-2 and EN 10025-3.

### Constructional data

Name	Value	Unit
Density	7850	kg/m <sup>3</sup>
Coefficient of thermal expansion	11.7	10 <sup>-6</sup> K <sup>-1</sup>
Thermal conductivity	-	W/(mK)
Melting point	1500	°C

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics.

### Base materials/Ancillary materials

The "S-PURE+ Bar Steel" products of Saarstahl AG are manufactured with 100 % continuously cast bloom (with about 97 % scrap and alloying elements) pre-material produced from EAF at Saarstahl Ascoval. The overall composition of the steel grades depends on the customer specification and application use of the final product.

The product contains substances in the European Chemicals Agency (ECHA) candidate list/ (15 January 2019) 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.

### Reference service life

The specification of a reference service life of any Bar Steel product is based on the multiple purposes and final application options (e.g. regarding stress levels).

The various steel grade options available, including the optimal choice of product or specification, do increase the lifetime drastically. However, the service life of any steel product can be enhanced by regular maintenance of the final user.

## LCA: Calculation rules

### Declared Unit

The reference unit is 1 ton of structural steel bar steel.

Foreground data describing the on-site production are integrated into the *LCA FE Software* model for all sites under study. The LCI is assessed based on annual production data. Background data are taken from the *LCA FE Database*.

### Declared unit and mass reference

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.

For the production of bar steel, the steel slab from Ascoval (France) is processed at the sites Nauweiler and Neunkirchen in Germany. If the bar steel were only be processed in one of the sites, the results for climate change would vary by +/-3,7 %.

### System boundary

Type of the EPD: cradle-to-gate - with modules C1-C4 and module D

Modules A1-A3 cover the production stage, including the upstream burdens of purchased raw materials, their transport

and the manufacturing at the production sites under study. Material and energy flows for the electric arc furnace (EAF) as well as the hot strip mills are considered. Electricity consumption of the production of the bar steel is modelled via residual grid mix (production in Germany/France + imports - exports -certified" green" electricity). The electricity consumed is modelled with 0,847 kg CO<sub>2</sub>e/kWh for Germany, and with 0,159 kg CO<sub>2</sub>e/kWh for France. The natural gas supplied is modelled with 0,559 kg CO<sub>2</sub>e/kg for Germany, and with 0,628 kg CO<sub>2</sub>e/kg for France.

Modules C1-C4 consider the dismantling of the considered product (C1, PhD Siebers), the transportation of the dismantled components to their final EoL destination (C2), the waste processing for reuse, recovery or recycling (C3), as well as the disposal (C4).

Module D refers to the End-of-Life, including recycling and/or reuse.

#### Geographic Representativeness

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

#### 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 *LCA FE Database* (CUP version 2024.2) was used to calculate the LCA.

## LCA: Scenarios and additional technical information

### Characteristic product properties of biogenic carbon

The declared product does not include biogenic carbon.  
Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>.

This EPD covers four End of Life scenarios (*Steel/Construction-info; Sansom, M./ Meijer, J.*):

- Scenario 0: 100 % Recycling
- Scenario 1: 100 % Reuse
- Scenario 2: 100 % Loss/Landfilled
- Scenario 3: 88 % Recycling, 11 % Reuse and 1 % Loss

Metals are assumed to reach the end of waste status directly at the construction site. The treatment, as well as net benefits and loads of reuse or recycling potentials (for the net scrap amount only), are grouped into module D.

### End of life (C1 - C4)

Name	Value	Unit
Landfilling - Scenario 0	0	kg
Landfilling - Scenario 1	0	kg
Landfilling - Scenario 2	1000	kg
Landfilling - Scenario 3	10	kg

### Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit
Recycling - Scenario 0	1000	kg
Recycling - Scenario 1	0	kg
Recycling - Scenario 2	0	kg
Recycling - Scenario 3	880	kg
Reuse - Scenario 0	0	kg
Reuse - Scenario 1	1000	kg
Reuse - Scenario 2	0	kg
Reuse - Scenario 3	110	kg

## LCA: Results

The following table contains the LCA results for a declared unit of 1 ton structural steel - bar steel.

**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 ton bar steel

Parameter	Unit	A1-A3	C1	C2	C3	C3/1	C3/2	C3/3	C4	C4/1	C4/2	C4/3	D	D/1	D/2	D/3
GWP-total	kg CO <sub>2</sub> eq	6.43E+02	2.1E+01	3.18E+00	0	0	0	0	0	0	1.5E+01	1.5E-01	2.4E+02	-6.43E+02	1.97E+03	1.6E+02
GWP-fossil	kg CO <sub>2</sub> eq	6.43E+02	2.1E+01	3.21E+00	0	0	0	0	0	0	1.5E+01	1.5E-01	2.41E+02	-6.43E+02	1.98E+03	1.61E+02
GWP-biogenic	kg CO <sub>2</sub> eq	2.91E-01	-8.58E-02	-8.04E-02	0	0	0	0	0	0	-1.03E-01	-1.03E-03	-1.42E+00	-2.91E-01	-1.17E+01	-1.4E+00
GWP-luluc	kg CO <sub>2</sub> eq	1.56E-01	1.16E-02	5.26E-02	0	0	0	0	0	0	8.98E-02	8.98E-04	3.21E-02	-1.56E-01	2.63E-01	1.37E-02
ODP	kg CFC11 eq	3.09E-09	8.98E-12	4.61E-13	0	0	0	0	0	0	4.04E-11	4.04E-13	-3.24E-10	-3.09E-09	-2.66E-09	-6.52E-10
AP	mol H <sup>+</sup> eq	1.92E+00	1.94E-01	4.16E-03	0	0	0	0	0	0	1.06E-01	1.06E-03	5.9E-01	-1.92E+00	4.84E+00	3.56E-01
EP-freshwater	kg P eq	3.07E-04	1.06E-04	1.34E-05	0	0	0	0	0	0	3.4E-05	3.4E-07	5.62E-05	-3.07E-04	4.61E-04	2.03E-05
EP-marine	kg N eq	4.16E-01	9.93E-02	1.5E-03	0	0	0	0	0	0	2.74E-02	2.74E-04	9.47E-02	-4.16E-01	7.77E-01	4.54E-02
EP-terrestrial	mol N eq	4.41E+00	1.09E+00	1.78E-02	0	0	0	0	0	0	3.01E-01	3.01E-03	8.49E-01	-4.41E+00	6.97E+00	3.31E-01
POCP	kg NMVOC eq	1.18E+00	2.7E-01	4.16E-03	0	0	0	0	0	0	8.37E-02	8.37E-04	3.85E-01	-1.18E+00	3.16E+00	2.4E-01
ADPE	kg Sb eq	7.93E-04	2.79E-06	2.73E-07	0	0	0	0	0	0	9.7E-07	9.7E-09	1.36E-03	-7.93E-04	1.12E-02	1.23E-03
ADPF	MJ	1.23E+04	2.9E+02	4.12E+01	0	0	0	0	0	0	1.97E+02	1.97E+00	2.4E+03	-1.23E+04	1.97E+04	9.52E+02
WDP	m <sup>3</sup> world eq deprived	7.06E+01	1.31E+00	4.85E-02	0	0	0	0	0	0	1.71E+00	1.71E-02	1.63E+01	-7.06E+01	1.33E+02	7.88E+00

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 ton bar steel

Parameter	Unit	A1-A3	C1	C2	C3	C3/1	C3/2	C3/3	C4	C4/1	C4/2	C4/3	D	D/1	D/2	D/3
PERE	MJ	1.11E+03	1.61E+01	3.55E+00	0	0	0	0	0	0	3.44E+01	3.44E-01	-9.46E+01	-1.11E+03	-7.76E+02	-2.13E+02
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	1.11E+03	1.61E+01	3.55E+00	0	0	0	0	0	0	3.44E+01	3.44E-01	-9.46E+01	-1.11E+03	-7.76E+02	-2.13E+02
PENRE	MJ	1.23E+04	2.9E+02	4.12E+01	0	0	0	0	0	0	1.97E+02	1.97E+00	2.4E+03	-1.23E+04	1.97E+04	9.52E+02
PENRM	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	1.23E+04	2.9E+02	4.12E+01	0	0	0	0	0	0	1.97E+02	1.97E+00	2.4E+03	-1.23E+04	1.97E+04	9.52E+02
SM	kg	1.14E+03	0	0	0	0	0	0	0	0	0	0	-1.39E+02	0	0	-1.33E+02
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m <sup>3</sup>	3.19E+00	4.34E-02	3.95E-03	0	0	0	0	0	0	5.23E-02	5.23E-04	2.44E+01	-3.19E+00	2E+02	2.31E+01

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 ton bar steel

Parameter	Unit	A1-A3	C1	C2	C3	C3/1	C3/2	C3/3	C4	C4/1	C4/2	C4/3	D	D/1	D/2	D/3
HWD	kg	1.67E-06	4.5E-08	1.58E-09	0	0	0	0	0	0	4.91E-08	4.91E-10	1.79E-05	-1.67E-06	1.47E-04	1.71E-05
NHWD	kg	6.53E+00	3.28E-02	6.73E-03	0	0	0	0	0	0	1E+03	1E+01	-2.9E+01	-6.53E+00	-2.38E+02	-2.86E+01
RWD	kg	2.1E+00	1.7E-03	7.51E-05	0	0	0	0	0	0	2.07E-03	2.07E-05	-2.63E-04	-2.1E+00	-2.15E-03	-2.31E-01
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	1E+03	0	0	8.8E+02	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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 ton bar steel

Parameter	Unit	A1-A3	C1	C2	C3	C3/1	C3/2	C3/3	C4	C4/1	C4/2	C4/3	D	D/1	D/2	D/3
PM	Disease incidence	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
IR	kBq U235 eq	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETP-fw	CTUe	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-c	CTUh	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-nc	CTUh	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SQP	SQP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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

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.

If the declared product (bar steel) would only be processed in one of the above listed sites (Nauweiler, Neunkirchen), the results for climate change would vary by +/-3,7 %.

## References

### EN10025:2004

EN 10025-1:2004, Hot rolled products of structural steels - Part 1: General technical delivery conditions.

EN 10025-2:2019, Hot rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels.

EN 10025-3:2019, Hot rolled products of structural steels - Part 3: Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels.

### EN 15804

EN 15804:2012+A1 2013, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

### 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.

### ISO 14025

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

### ECHA Candidate List

ECHA Publication: Candidate List of substances of very high concern for Authorisation (published in accordance with Article 59(10) of the REACH Regulation).

### Use of biocidal products EU Regulation No. 528/2012

Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products Text with EEA relevance.

### IBU 2024

Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., [www.ibuepd.com](http://www.ibuepd.com)

**LCA FE (GaBi) Software / Database**

LCA FE, Software and Database for Life Cycle Engineering,  
Sphera Solution GmbH, Leinfelden-Echterdingen,  
2024, <http://documentation.gabi-software.com>

**PCR, Part A**

Product Category Rules for Building -Related Products and  
Services, Calculation Rules for the Life Cycle Assessment and  
Requirements on the Project Report according to  
EN15804+A2:2019, version 1.4, Institut Bauen und Umwelt  
e.V., [www.bau-umwelt.com](http://www.bau-umwelt.com), 2024

**PCR, Part B**

Requirements on the EPD for Structural steels – Institut Bauen  
und Umwelt e.V., Königswinter (pub.): From the range of  
Environmental Product Declarations of Institute Construction  
and Environment e.V. (IBU), version /v 11, 2024

**Sansom, M. / Meijer, J.**

Life-cycle assessment (LCA) for steel construction,  
Ascot, Culemborg, 2002

**SteelConstruction-info**

[https://www.steelconstruction.info/The\\_recycling\\_and\\_reuse\\_survey](https://www.steelconstruction.info/The_recycling_and_reuse_survey)

**Publisher**

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

+49 (0)30 3087748- 0  
[info@ibu-epd.com](mailto:info@ibu-epd.com)  
[www.ibu-epd.com](http://www.ibu-epd.com)

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**Programme holder**

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

+49 (0)30 3087748- 0  
[info@ibu-epd.com](mailto:info@ibu-epd.com)  
[www.ibu-epd.com](http://www.ibu-epd.com)

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**Author of the Life Cycle Assessment**

Sphera Solutions GmbH  
Hauptstraße 111- 113  
70771 Leinfelden-Echterdingen  
Germany

+49 711 341817-0  
[info@sphera.com](mailto:info@sphera.com)  
[www.sphera.com](http://www.sphera.com)

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**Owner of the Declaration**

Saarstahl AG  
Bismarckstraße 57-59  
66333 Völklingen  
Germany

00496898100  
[saarstahl@saarstahl.com](mailto:saarstahl@saarstahl.com)  
<https://www.saarstahl.com/>