ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	Saarstahl Ascoval
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SAC-20250296-CBA1-EN
Issue date	12.08.2025
Valid to	11.08.2030

S-PURE+ Bloom

Saarstahl Ascoval

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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General Information

Saarstahl Ascoval

Programme holder

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Hegelplatz 1
10117 Berlin
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Declaration number

EPD-SAC-20250296-CBA1-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+ Bloom

Owner of the declaration

Saarstahl Ascoval
Rue du Galibot 4
59880 Saint-Saulve
France

Declared product / declared unit

The declared unit is 1 metric ton of bloom/slab.

Scope:

The EPD declaration applies to 1 metric tonne of bloom manufactured at Saarstahl Ascoval.

The "S-Pure+" blooms are high-quality products from Saarstahl Ascoval located in St. Saulves (France). It is a subsidary of the Saarstahl group specialised in secondary steelmaking.

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
☐ internally ☒ externally

Dr. Niels Jungbluth,
(Independent verifier)

Product

Product description/Product definition

Saarstahl Ascoval in Saint-Saulve, France, a secondary steelmaking site is part of the Saarstahl Group. The plant produces continuously cast billets and blooms (round, square and rectangular formats) from non-alloyed and alloyed steel with an annual capacity of 500,000 tons.

Saarstahl Ascoval has an electric arc furnace (90 tons, 116 MVA), a ladle furnace (14 MVA), a twin-tank VOD system, and a four-strand continuous casting line. The producting based on a circular economy model by recycling scrap to produce low emission steel in the electric arc furnace. 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.

Steel grades are hamonised according to EN 13674-1 to 4 and EN 14811 e.g. R200, R220, R260, R320 Cr, R350HT, R400HT . Mechanical grades, Resulfurized grades, High yield grades: S355, C45, C55, 50CrMo4, 42CrMo4, 34CrNiMo6, 20Mn4-5-6, 18MnCr5
Oil and Gas application API5CT carbon steels and chromium steels: L80, P110, T95, 5%cr, 4130, 4140, Line pipes API5L X52
Electrical power plant, products, ASTM grades B, C, T11, T22, T24, S355, P5
Bearing steels: 100Cr6

Application

With its semi-finished products, Saarstahl Ascoval is at the beginning of a wide range of value chains. While Saarstahl Ascoval supplies much of its billets and blooms to processing companies within the Saarstahl Group itself, the products are supplied into a wide range of other applications like for example:

Rails:
Saarstahl Rail is a manufacturer of rails using the secondary steelmaking pre-material to develop a circular economy in cooperation with Saarstahl Ascoval. It offers catalogue, available for more than 25 steel grades and lengths up to 108 meters. To ensure the consistent high quality of its products, Saarstahl Rail adheres to strict manufacturing standards from steel production through to rolling and final inspection.

Seamless pipes:
Saarstahl Ascoval has been supplying blooms used to produce high volumes of round blooms, which are in turn used to make seamless tubes, OCTG, precision tubes, and mechanical tubes.

Various long products:
Saarstahl Ascoval supplies Saarstahl with a wide range of grades in forging steels, spring steels, free cutting steels, and drawing qualities. Applications include rail clamps in the railway sector, tire cord in the automotive sector, the construction sector and a number of forging applications.

Technical Data

The EPD refers to all EAF based bloom and billet products from Saarstahl Ascoval
in a variety of different steel grades, dimensions, shapes and as-delivered conditions.

Constructional data

Name	Value	Unit
Density	7850	kg/m^3
Coefficient of thermal expansion	11.7	$10^{-6}K^{-1}$
Thermal conductivity	50	W/(mK)
Melting point	1500	°C

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

Base materials/Ancillary materials

The "S-PURE+ Bloom" products of Saarstahl Ascoval 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 bloom product is based on the multiple purposes and final application options (e.g. regarding stress levels (example rail applications: high-speed traffic, mixed traffic, heavy loads, passenger traffic, urban traffic, switch technologies)).
The various steel grade options avalable, including the optimal choice of product or specification, do increase the lifetime drastically.

With blooms being a semi-finished product, the application type can vary widely. 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 bloom/slab.

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.

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) are considered. Electricity consumption of the production of the bloom/slab is modelled via residual grid mix (production in France + imports - exports -certified" green" electricity). The electricity consumed is modelled with 0,159 kg CO_2e/kWh. The natural gas supplied is modelled with 0,628 kg CO_2e/kg.

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_2.
This EPD covers one End of Life scenario: 100% Recycling

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

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

Name	Value	Unit
Recycling - Scenario 0	1000	kg
Reuse - Scenario 0	0	kg

LCA: Results

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

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 bloom/slab

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	4.57E+02	2.1E+01	3.18E+00	0	0	2.16E+02
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	4.57E+02	2.1E+01	3.21E+00	0	0	2.17E+02
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	6.38E-02	-8.58E-02	-8.04E-02	0	0	-1.28E+00
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	1.25E-01	1.16E-02	5.26E-02	0	0	2.89E-02
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	2.66E-09	8.98E-12	4.61E-13	0	0	-2.92E-10
Acidification potential of land and water (AP)	mol H^+ eq	1.55E+00	1.94E-01	4.16E-03	0	0	5.32E-01
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	2.09E-04	1.06E-04	1.34E-05	0	0	5.06E-05
Eutrophication potential aquatic marine (EP-marine)	kg N eq	3.06E-01	9.93E-02	1.5E-03	0	0	8.54E-02
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	3.24E+00	1.09E+00	1.78E-02	0	0	7.65E-01
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	8.81E-01	2.7E-01	4.16E-03	0	0	3.47E-01
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	7.14E-04	2.79E-06	2.73E-07	0	0	1.23E-03
Abiotic depletion potential for fossil resources (ADPF)	MJ	9.32E+03	2.9E+02	4.12E+01	0	0	2.16E+03
Water use (WDP)	m^3 world eq deprived	4.61E+01	1.31E+00	4.85E-02	0	0	1.47E+01

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 ton bloom/slab

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	9.24E+02	1.61E+01	3.55E+00	0	0	-8.53E+01
Renewable primary energy resources as material utilization (PERM)	MJ	0	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	9.24E+02	1.61E+01	3.55E+00	0	0	-8.53E+01
Non renewable primary energy as energy carrier (PENRE)	MJ	9.32E+03	2.9E+02	4.12E+01	0	0	2.16E+03
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	9.32E+03	2.9E+02	4.12E+01	0	0	2.16E+03
Use of secondary material (SM)	kg	1.13E+03	0	0	0	0	-1.25E+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	2.38E+00	4.34E-02	3.95E-03	0	0	2.2E+01

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 ton bloom/slab

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	1.35E-06	4.5E-08	1.58E-09	0	0	1.62E-05
Non hazardous waste disposed (NHWD)	kg	5.43E+00	3.28E-02	6.73E-03	0	0	-2.61E+01
Radioactive waste disposed (RWD)	kg	1.82E+00	1.7E-03	7.51E-05	0	0	-2.37E-04
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	0	0	0	1E+03	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 ton bloom/slab

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

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.

References

EN 13674

EN 13674-1:2017, Railway applications - Track - Rail Part 1: Vignole railway rails 46 kg/m and above.

EN 13674-2:2020, Railway applications - Track - Rail Part 2: Switch and crossing rails used in conjunction with Vignole Rail 46kg/m and above.

EN 13674-3:2010, Railway applications - Track - Rail Part 3: Check rails.

EN 13674-4:2020, Railway applications - Track - Rail Part 4: Vignole railway rails from 27 kg/m to, but excluding 46 kg/m.

EN 14811

EN 14811:2019, Railway applications - Track- Special purpose rail - Grooved rails and associated construction profiles.

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
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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, 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

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