Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Bright Bars

from

ArcelorMittal Europe – Long Products

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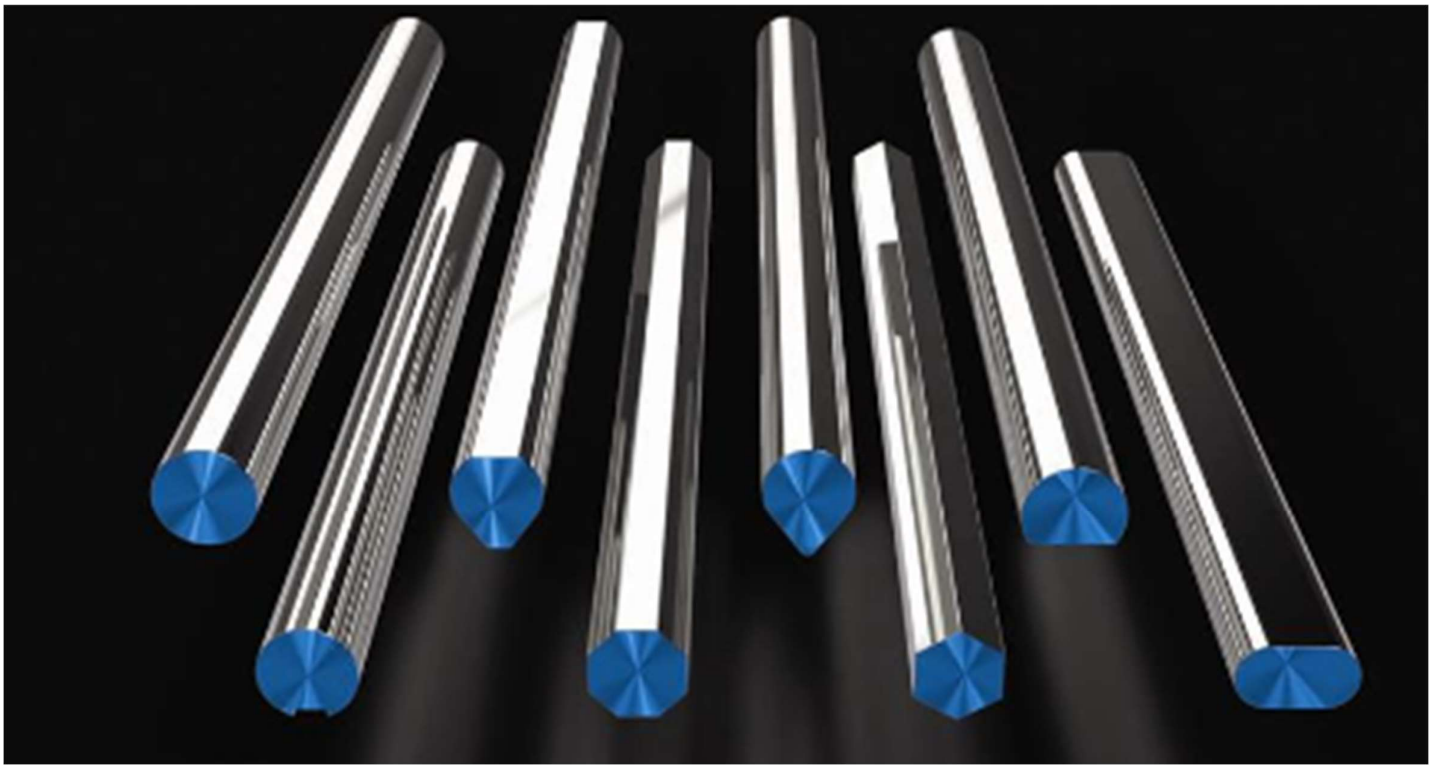
An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *PCR 2019:14 Construction products, version 1.3.1 Published on 2023.06.20. Based on CEN standard EN 15804. ISO standard ISO 21930 and CEN standard EN 15804 serves as the core PCR. UN CPC code 41261*
PCR review was conducted by: The Technical Committee of the International EPD®System. See www.environdec.com/TCfor a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Life Cycle Assessment (LCA)
LCA accountability: *Luxemburg Institute of Science and Technology (LIST)*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third party verifier: *Matt Fishwick, Fishwick Environmental Ltd*      Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No [Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier]

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

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

For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: ArcelorMittal Europe – Long Products.
66, rue de Luxembourg
L-4221 Esch-sur-Alzette
Luxembourg

Contact: ws@arcelormittal.com

Description of the organisation:
ArcelorMittal Europe – Long Products operates different production sites in ten countries and is a leader in the manufacture of sections, sheet piles, rails, quality wire rod, rebars, bars and wires drawing. (Wires Solutions).
ArcelorMittal Wires Solutions is part of ArcelorMittal Europe – Long Products.

Wires Solutions is one of the Europe's largest wire drawers.
It is composed of 9 plants and 2 warehouses able to propose a large range of solution and products as, the steel fibres, the CHQ products, FSW, bars, industrial wires, wires for fencing, ropes and CRW. This wide range of products makes it possible to meet mainly the demands of the markets, construction, energy, automotive, industry or agriculture.

Our journey towards becoming carbon neutral by 2050 is well underway. In line with the Paris Climate Goals and the European Green Deal, ArcelorMittal has also committed to reduce CO_2 emissions in its European operations by 35% by 2030.

Product-related or management system-related certifications:
Bright Bars mills are covered by ISO 14001, ISO 9001, ISO 45001, ISO 50001, and ISO TS 16949 (now IATF), EN 10277, EN 10204-3.1

Name and location of production site(s): ArcelorMittal Revigny-sur-Ornain in France and ArcelorMittal Dortmund in Germany.

Product information

Product name: Bright Bars.

Product identification: Recognized for the manufacture or custom-made steel grades as free cutting, drawing, and peeled, ArcelorMittal Bright Bars offer a diverse range of solutions to many markets including automotive, agriculture, general mechanical engineering.

Product description:

Product range	**1. Drawn profiles (3 to 7m length)** Round from 5 to 80mm; hexagons from 5 to 65mm. Cut to lengths, for for more details please consult us. **2. Grinded profiles** (1.5 to 7m length) Round from 5 to 50mm **3. Peeled bars** (3 to 8m length) Round from 20 to 100mm (H9 Tolerance possible)

Delivered product may contain many types of alloys, depending on the intended performance and characteristic of the steel product.
The main steel grades used, refer to European standards, as follows: EN 10277. The various steel grades are sold as drawn, peeled or grinded profiles, with or without chamfering. ArcelorMittal is also able to provide specific profiles (simple forms).

An extensive range of products including:

› Low carbon steel for free cutting
› Free cutting steel grades for heat treatment
› Carbon grades
› Alloyed grades.

The base material of Bright Bars is the wire Rod from BOF route using mainly Iron-ore, Coking coal and Scrap. The most common elements are carbon, manganese and silicon. Other elements like copper may be present in the steel. The composition of these elements depends on the steel designation/grade.

Quality and production control: ISO 9001 / ISO TS 16949 (now IATF) / ISO 14001 / ISO 45001
ISO 50001 / EN 10277 / EN 10204-3.1

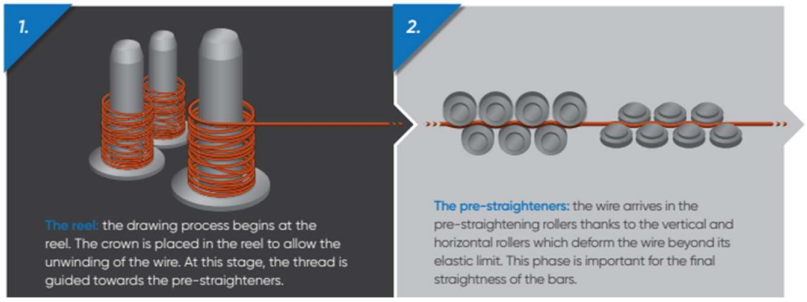
Monitoring according to the product standards and certifications.

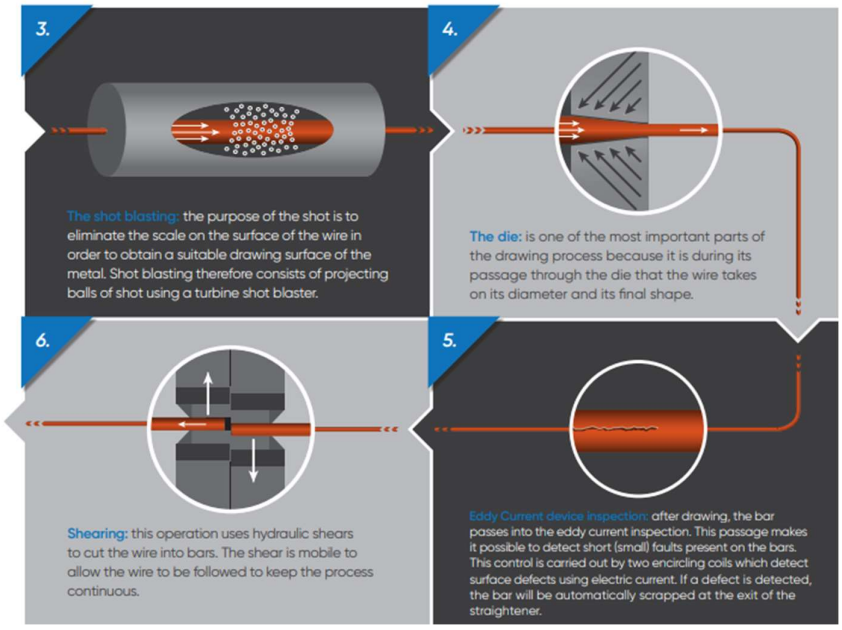
This EPD is valid for of various grades and geometries.

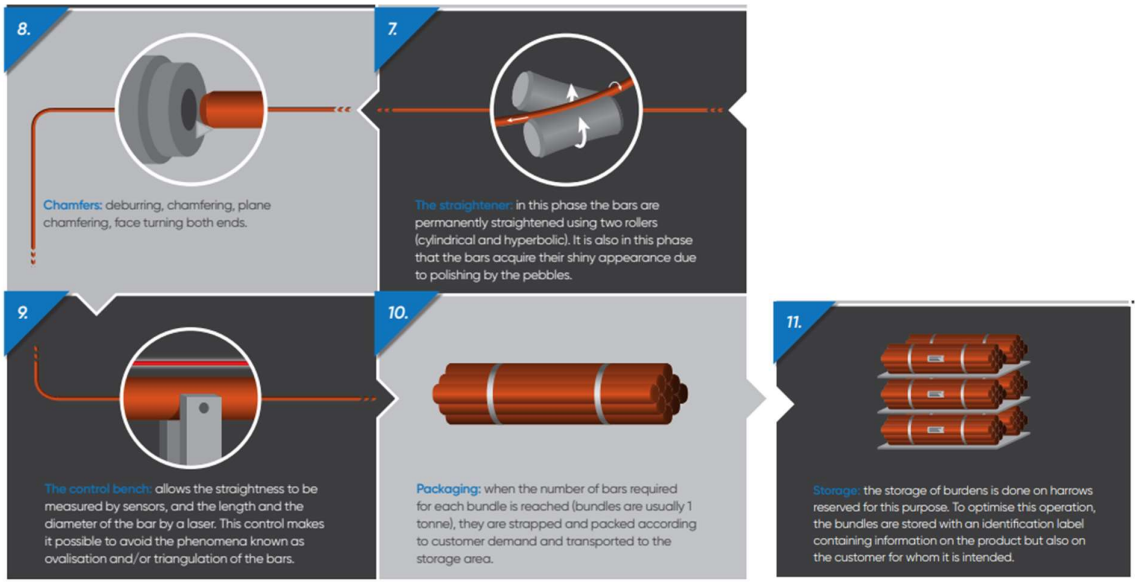
Content information:
Example of typical of a chemical composition of Bright Bars.

Typical analysis of steel		
C	Mn	Si
0.14	0.9-1.3	≤0.05

Manufacturing process:







Applications:

The size of the delivery is functions of the intended application and project.

Additional information on Bright Bars products can be found at:
https://barsandrods.arcelormittal.com/repository2/WireSolutions/Bright%20Bars%20Brochure%202022%20ENG%20WEB.pdf

UN CPC code: 41261.

Geographical scope: Europe.

LCA information

Functional unit / declared unit: 1 metric tonne of Bright Bars.

Reference service life: Not applicable.

Time representativeness: The collection of the foreground data refers to the year 2021.

Database(s) and LCA software used: The background data has been taken from the latest available Sphera Managed LCA Content 2023.2 and the LCA model was created using LCA Sphera for Experts software, version 10.7.1.28.

Description of system boundaries: Cradle-to-gate with options, modules C1–C4, and module D.

System Diagram

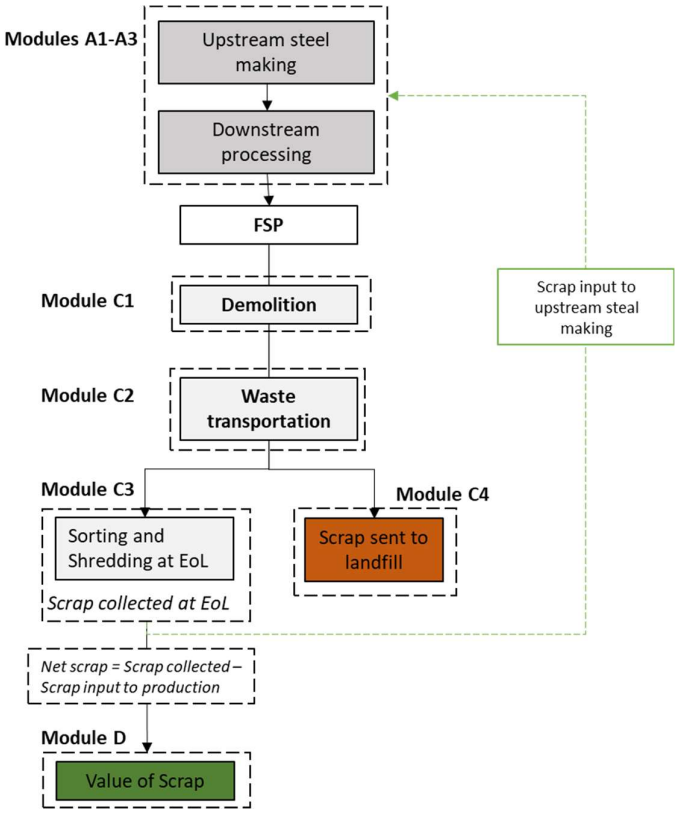


Figure 1: Life cycle stages and unit processes of the product

- *Module A1 to A3:*

The product stage includes provision of all materials, products, and energy, as well as waste processing up to the end-of waste state or disposal of final residues during the product stage. These modules consider the production of steel wire, the transport within the site as well as the manufacturing of Bright Bars in Revigny-sur-Ornain and in Dortmund.

The electricity mixes considered for the various downstream processing sites are country-specific (national generic background data) and are representative of the average consumption mix for the country. They were chosen according to the plant location.

The resulting weighted average emission factor for the GWP-GHG indicator for the residual mix is 260.8 $gCO_2eq./kWh$.
The modelling is based on datasets from the 2023.2 Managed LCA Content (Sphera) database.

- *Module C1 to C4:*

Within this EPD, the modules C1-C4 are included. These modules consider the dismantling of the considered product (C1), the transportation of the dismantled components to their End-of-Life (EoL) destination (C2), the waste processing for recovery or recycling (C3) as well as the disposal (C4), if given. At EoL, the steel material leaves the product system in C3 for recycling in Module D. The environmental impacts from grinding, sorting and transportation of steel scrap are not included. The considered EoL scenario for the steel material is 90% recycling and 10% landfill.

Category	Subcategory	Unit	Quantity
Collection process	Collected separately	kg	900
	Collected with mixed construction waste	kg	100
Recovery	Reuse	kg	0
	Recycling	kg	900
	Landfill	kg	0
	Incineration	kg	0
	Incineration with energy recovery	kg	0
	Energy conversion efficiency rate	kg	0
Disposal	Material for final disposal	kg	100
Transport	Deconstruction site to scrap processing plant	km	0
	Scrap processing plant to site for end of waste	km	300

- *Module D:*

Module D includes any declared benefits and loads from net flows leaving the product system that have not been allocated as co-products and that have passed the end-of-waste state in the form of reuse, recovery and/or recycling potentials.

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 to module D.

Potential environmental benefits are given for the net steel scrap that is produced at the end of a final product's life. This net scrap is determined as follows:
Net scrap = Amount of steel recycled at end-of-life – Scrap input from previous product life cycles.
The amount of steel for avoided production (0.75 t/t) is calculated by the difference between scrap collected (0.90 t/t) and scrap input to production (0.15 t/t).

This End-of-Life scenario represents an average use of the entire ArcelorMittal's Bright Bars.

Cut-off criteria:
The environmental impact of the product studied has been assessed by considering all significant processes, materials, and emissions. Excluded flows are assumed to have a negligible impact, contributing less than 5% to the cumulative impact assessment categories. The production of capital equipment, facilities, and infrastructure required for upstream and downstream steel production processes are also assumed to have negligible impacts and were neglected.

Data quality and sources: Data quality is compliant with ISO 14025:2006. All primary data were collected for 2021. All background data come from the Sphera Managed LCA Content 2023.2 databases and are representative for the years 2018-2023.

Allocation:
Primary data are allocated using the partitioning approach developed by worldsteel/EUROFER. The results for GWP-total and GWP-GHG indicators would increase marginally if no allocation was applied. Scrap inputs in module A1-A3, including pre-consumer scrap, are treated as 'burden free'. Scrap produced and used internally within the company but in a different product system has been considered without any value (economic allocation, with a value of zero). Externally sourced pre-consumer scrap was treated as post-consumer scrap meaning that the only burdens considered are a transport burden, taken into account in A2, and a burden on the end-of-life scenarios (waste processing, transport, and destination). For such scraps, economic allocation was deemed not feasible. For all background data used in the model, the standard allocation assumptions of the used datasets were maintained.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results)

(✓= included; ND = module not declared)

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	NR	NR	NR	NR	NR	NR	NR	NR	NR	X	X	X	X	X
Geography	Europe			-	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data used	>95%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Considering the high recyclability of steel products, the system boundaries are cradle-to-gate with modules C1–C4 and module D. The system boundaries include the product manufacturing (raw materials supply (A1), transport of raw materials to production site (A2), manufacturing (A3)), demolition

(C1), waste transportation (C2), waste processing and disposal (C3 & C4), and the benefits and loads beyond the product system boundary are also declared (D).

Based on average figures provided by ArcelorMittal, it was considered that 10% of the Bright Bars are disposed in landfill (C4) at their end of life, and 90% are recycled into new steel products. Impacts and aspects related to waste are considered in the module in which the waste occurs.

The impacts linked to the transportation (A4) and the installation (A5) of the product were excluded because the related inventory was too context dependent to be averaged in a representative way, and the use stage has been neglected, as basically no maintenance is needed (modules B1 to B7 excluded).

Content information

Product content	**Weight, kg**	**Post-consumer material, weight-%**	**Biogenic material, weight-% and kg C / kg**
Steel	1000	0%[1]	0% and 0 kg C / kg
Chemical composition of product (%)	**Average**	**Range**	
Iron	97	-	-
Carbon	0.14	-	-
Manganese	1.1	0.9-1.3	-
Silicon	< 0.05	-	-
Copper	< 0.2	-	-
Other	< 1.8	-	-
Packaging materials		**Weight-% (versus the product)**	**Weight biogenic carbon, kg C / kg**
Wood palette	2.11	< 1%	9.78E-05
Steel wire	0.13	< 1%	

[1]The total value of recycled content is 90% but the post-consumer part is unknown.

The product do not contain any of the substances of very high concern (SVHC) regulated by the Regulation (EC) No 1907/2006 (REACH) or the Regulation (EC) No 1272/2008 of European parliament. Also, no packaging is considered in the scenario.

Results of the environmental performance indicators

The environmental performance of the functional unit of one metric ton of Bright Bars, are reported below using the parameters and units as specified in PCR 2019:14.
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Mandatory impact category indicators according to EN 15804+A2:2019

Results per one metric tonne of Bright Bars							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	2.63E+03	0.00E+00	2.11E+01	1.53E+00	1.49E+00	-1.45E+03
GWP-biogenic	kg CO_2 eq.	1.84E+00	0.00E+00	1.53E-02	4.83E-03	-4.42E-02	7.41E-01
GWP-luluc	kg CO_2 eq.	8.22E-01	0.00E+00	1.45E-01	9.15E-04	2.75E-03	-2.99E-02
GWP-total	kg CO_2 eq.	2.63E+03	0.00E+00	2.13E+01	1.53E+00	1.45E+00	-1.45E+03
ODP	kg CFC 11 eq.	8.00E-07	0.00E+00	2.12E-12	1.99E-11	3.51E-12	-3.17E-12
AP	mol H^+ eq.	5.46E+00	0.00E+00	1.27E-01	3.77E-03	1.06E-02	-3.12E+00
EP-freshwater	kg P eq.	1.23E-03	0.00E+00	7.70E-05	4.47E-06	2.53E-06	-2.63E-04
EP-marine	kg N eq.	5.49E+00	0.00E+00	6.20E-02	1.03E-03	2.71E-03	-5.48E-01
EP-terrestrial	mol N eq.	1.39E+01	0.00E+00	6.87E-01	1.11E-02	2.97E-02	-4.81E+00
POCP	kg NMVOC eq.	4.51E+00	0.00E+00	1.20E-01	2.83E-03	8.22E-03	-2.22E+00
ADP-minerals&metals*	kg Sb eq.	1.62E-03	0.00E+00	2.17E-06	3.85E-07	1.53E-07	-3.62E-03
ADP-fossil*	MJ	2.34E+04	0.00E+00	2.83E+02	2.68E+01	1.95E+01	-1.33E+04
WDP*	m^3	7.18E+01	0.00E+00	2.41E-01	3.12E-01	1.64E-01	-2.70E+02

Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment.EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator. We discourage the use of the results of modules A1-A3 without considering the results of module C.*

Resource use indicators according to EN 15804+A2:2019

Results per one metric tonne of Bright Bars							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	4.15E+02	0.00E+00	1.96E+01	1.39E+01	2.93E+00	8.40E+02
PERM	MJ	2.50E-04	0.00E+00	8.61E-11	-6.77E-10	6.51E-11	1.74E-04
PERT	MJ	4.15E+02	0.00E+00	1.96E+01	1.39E+01	2.93E+00	8.40E+02
PENRE	MJ	2.26E+04	0.00E+00	2.84E+02	2.68E+01	1.96E+01	-1.33E+04
PENRM	MJ	7.25E+00	0.00E+00	1.23E-02	1.98E-03	6.16E-04	-4.07E-01
PENRT	MJ	2.26E+04	0.00E+00	2.84E+02	2.68E+01	1.96E+01	-1.33E+04
SM	kg	3.31E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.00E+02
RSF	MJ	4.30E-04	0.00E+00	1.89E-07	4.12E-08	3.20E-08	-4.48E-01
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.79E+00	0.00E+00	2.27E-02	1.32E-02	4.97E-03	-6.09E+00
Acronyms	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						

Waste indicators according to EN 15804+A2:2019

Results per one metric tonne of Bright Bars							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	9.44E-05	0.00E+00	1.50E-09	1.20E-07	1.00E-09	-1.03E-07
Non-hazardous waste disposed	kg	9.39E+00	0.00E+00	4.63E-02	1.88E-02	1.00E+02	2.02E+02
Radioactive waste disposed	kg	1.03E-01	0.00E+00	5.27E-04	3.95E-03	2.17E-04	1.66E-03

Output flow indicators according to EN 15804+A2:2019

Results per one metric tonne of Bright Bars							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	4.17E+01	0.00E+00	0.00E+00	9.00E+02	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	9.22E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	1.59E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Other environmental performance indicators according to EN 15804+A2:2019

Results per one metric tonne of Bright Bars							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG	kg CO_2 eq.	2.63E+03	0.00E+00	2.13E+01	1.53E+00	1.49E+00	-1.45E+03
Biogenic carbon content in product	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content in packaging	kg	2.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

References

- General Programme Instructions of the International EPD® System. Version 4.0.
- PCR 2019:14. Construction Products, Version 1.2.5
- Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data; CEN/TR 15941:2010
- CPR: Regulation (EU) No 305/2011 of the European parliament and of the council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.
- EN 15804: EN 15804:2012+A2:2019: Sustainability of construction works -Environmental Product Declarations - Core rules for the product category of construction products.
- EN ISO 14025: EN ISO 14025:2011-10 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
- EN ISO 14040: EN ISO 14040:2009-11 Environmental management - Life cycle assessment - Principles and framework
- EN ISO 14044: EN ISO 14044:2006-10 Environmental management - Life cycle assessment - Require-ments and guidelines.
- LCA FE: LCA FE Software System and Database for Life Cycle Engineering, Sphera Solution GmbH, Leinfelden-Echterdingen, 2022 (https://www.gabi-software.com/support/gabi)
- ASTM A572 / A572M-21e1:2021, Standard: Specification for High-Strength Low-Alloy Columbium- Vanadium Structural Steel, ASTM International, West Conshohocken, PA, 2021.
- ASTM A6 / A6M-22:2022, Standard: Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling, ASTM International, West Conshohocken, PA, 2022.
- CSA G40.20:2013, General requirements for rolled or welded structural quality steel. Canadian Standard Association.
- CSA G40.21:2013, General requirements for structural quality steel. Canadian Standard Association.
- ISO 9001: 2015, Quality management systems — Requirements
- ISO 45001:2018, Occupational health and safety management systems — Requirements with guidance for use
- ISO 14001:2015, Environmental management systems — Requirements with guidance for use
- ISO 50001: 2018, Energy Management