

Environmental Product Declaration

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

Brass Bars

from

Nordic Brass Gusum AB



EPD of multiple products, based on the average results.

The products covered by the EPD are specified under the product description.

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products, based on the average results of the product group
EPD registration number:	EPD-IES-0032885:001
Version date:	2026-07-03
Validity date:	2031-07-03
<i>An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com</i>	



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
E-mail:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR), specifically EN15804:2012+A2:2019/AC:2021
Product Category Rules (PCR): PCR 2019:14 Construction products, version 2.0.1 of 2025-06-05
PCR review was conducted by: <name and organisation of the review chair, and information on how to contact the chair through the programme operator>
Review chair:

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
☒ Individual EPD verification without a pre-verified LCA/EPD tool Third-party verifier: Anna, Pantze, Tyréns Sverige AB. Approved by: International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

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

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD:

Nordic Brass Gusum AB

Gräsdalen 1, 615 71 Gusum, Sweden

info@nordicbrass.se

<https://nordicbrass.se/>

Contact: Christian Lundqvist

LCA practitioner: Karin Eriksson, Envima AB

Description of the organisation: Nordic Brass Gusum AB (Nordic Brass Gusum) is one of Sweden's oldest industrial companies, with origins dating back to the 17th century, and is today the only brass producer in the Nordic region. Production comprises approximately 25,000 tonnes of brass in the form of bars, ingots, nuts and hot-forged components. The brass is produced in the company's own factory in Gusum Sweden.

Brass is a material offering wide possibilities and applications. The fundamental components are copper and zinc. Through the addition of various alloying elements, brass can be given distinctive properties, resulting in numerous grades suited for different processing methods and end products.

At Nordic Brass Gusum, brass is manufactured in the form of bars, profiles, and ingots. These semi-finished products are subsequently refined by customers. Typical end products include screws, nuts, plumbing fittings, lock components, electrical parts, decorative objects, and more.

The company operates according to a circular business model, meaning that copper and brass scrap are recycled. Scrap generated within the company's own operations is reused internally, while metal-containing by-products such as slag and dust are recycled externally.

The production processes include charge preparation, melting, casting, rod extrusion, cold working, finishing, hot forging, and nut manufacturing.

Product-related or management system-related certifications: Certified management systems are ISO 9001, ISO 14001 and ISO 50001.

PRODUCT INFORMATION

Product name: Brass Bars

Included products:

- CW510L
- CW511L
- CW602N
- CW625N
- CW626N
- CW603N
- CW607N
- CW612N
- CW614N
- CW617N
- CW709R
- CW713R
- CW721R

Product description:

Bars are produced from continuous casted billets through extrusion and cold drawing in diameter 5mm to 100mm and conform to EN-12163, EN-12164, EN-12165 and EN-12167 standards. In shapes of round, hex, square and profile bars.

Alloys we are currently producing:

CW510L	CW511L	CW602N	CW625N	CW626N	CW603N	CW607N
CW612N	CW614N	CW617N	CW709R	CW713R	CW721R	

The semi-finished products are further processed by customers into a wide range of end-use applications. Typical construction-related applications include plumbing components, fittings, valves, connectors, fasteners (e.g., screws and nuts), as well as components used in locks, electrical systems, and decorative elements.



UN CPC code: 415 - Semi-finished products of copper, nickel, aluminium, lead, zinc and tin or their alloys

Name and location of production site: Nordic Brass Gusum AB, Gusum, Sweden.

CONTENT DECLARATION

The product consists of brass. The content declaration presented below is representative of the product group covered by this EPD. All included products consist of brass. Small variations in alloy composition (e.g. alloying elements within standard specification ranges) may occur between individual products. The declared values represent an average composition considered to be representative for all included products.

The packaging material consists of plastic film and steel straps to secure the product for transport to customers.

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Pre-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Brass	1,0	35,6%	57,4%	0%	0
TOTAL	1,0	35,6%	57,4%	0%	0

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Plastic film	1,90E-04	0,019%	0
Steel straps	3,36E-04	0,034%	0
TOTAL	5,26E-04	0,053%	0

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO₂.

Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product or declared unit
Lead	231-100-4	7439-92-1	0,1-3,5 %

LCA INFORMATION

Declared unit: 1 kg Brass Bars at the factory gate plus end-of life and resource recovery stages.

Time representativeness: The LCA is based on production data from 2025 and is deemed to be representative of an average year of production.

Geographical scope:

The EPD is representative for the Swedish market. Module A1 and A2 Material from Europe, Module A3 production is located in Sweden, Module C and D scenarios are for Sweden.

Database(s) and LCA software used: The LCA software is SimaPro 10.3.0.3 and the database is Ecoinvent 3.11. When modelling in Simapro, Ecoinvent data (updated 2024) has been used for generic data.

Description of system boundaries: Cradle to gate (A1-A3), end of life (C1-C4) and benefits beyond system boundary (D) (A1-A3 + C + D)

In module A1, the raw material input consists predominantly of recycled materials. A share originates from post-consumer recycled material, supplied by waste management contractors. A significant portion also consists of pre-consumer recycled material generated at customer sites. Through a return system, Nordic Brass Gusum collects brass chips and scraps during product deliveries.

Module A2 includes transport of raw materials from suppliers to the Nordic Brass Gusum production facility. All inbound transports are carried out using Euro 6 vehicles. In addition, the return of brass chips from customers is modelled as transport using Euro 6 vehicles operating on HVO100.

In module A3 (production stage), the raw material is delivered to Nordic Brass Gusum production facility, where it is melted in a smelting furnace. The molten metal is subsequently processed in a pressing plant and rod mill to produce brass bars. The finished bars are then packaged and prepared for delivery to customers. The production stage includes all relevant energy use, including electricity and fuels, as well as internal waste handling and process losses.

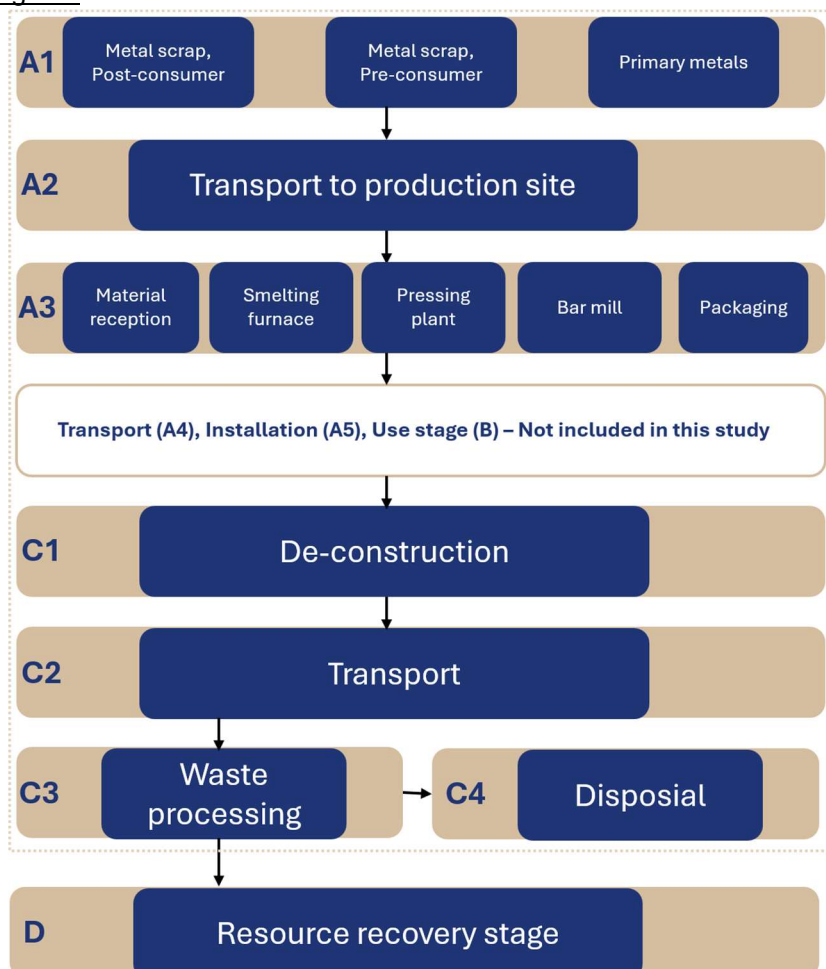
No representative scenarios can be defined for transport and installation (A4-A5); therefore, these modules are not included. The use stage (B1-B7) is also excluded as it falls outside the system boundary and varies significantly between applications.

Modules C1-C4 represent the end-of-life stage, including deconstruction or demolition, transport to waste processing, waste treatment, and final disposal. In the absence of site-specific data, default scenarios in accordance with the applicable PCR have been applied. The applied assumptions and scenarios are described in the table below.

Module	Description
C1 – Deconstruction	As the product is used in multiple applications, no specific demolition or deconstruction data is available. Therefore, default PCR data for module C1 has been applied. ("Demolition/deconstruction of steel, wood, and other materials")
C2 - Transport	In module C2, transportation to waste treatment is assumed to be 80 kgkm, using a 16–32 metric ton lorry (EURO5), in line with the default transport scenario defined in the applicable PCR.
C3 – Waste processing	In module C3, waste processing is modelled assuming that 95% of the product is sent to material recycling, based on default parameters for copper alloys from PEF Guidance. The collected material is transported to a sorting facility, where loading, unloading, mechanical sorting, and treatment processes are carried out and modelled using default values from the applicable PCR.
C4 - Disposal	Module C4 represents disposal of the residual material fraction not recovered for recycling. Based on the selected end-of-life scenario, 5% of the product is assumed to be disposed of as inert waste and modelled using a generic landfill process.

Module D includes potential benefits and loads beyond the system boundary associated with the recycling of brass. It is based on the net flow of secondary material leaving the product system at end of life, defined as the difference between the amount of material sent to recycling and the recycled content already used as input. A recycling rate of 95% is assumed, and material losses are accounted for using a quality factor. The resulting net export of secondary brass is assumed to substitute the production of primary brass, and the impacts of the secondary production processes are included accordingly.

Process flow diagram:



Cut-off rules and excluded processes:

This EPD applies the cut-off criteria of EN 15804/PCR. The LCI covers $\geq 99\%$ of mass and energy at unit-process level and $\geq 95\%$ of mass, energy, and environmental impact per aggregated module; exclusions were based on sensitivity analyses showing $< 1\%$ contribution per module. The following flows/processes were excluded due to cut-off: Small flows of various alloys $< 0,1\%$ of the product weight. Routine maintenance activities in A3 were assessed as negligible and excluded. In accordance with PCR, personnel-related processes (business travel, commuting, R&D) are excluded. Infrastructure and capital goods are excluded. For the electricity used in A3, construction of the power plant was also excluded as it contributes $< 1\%$ to total GHG. These exclusions are consistent with the supporting LCA report and do not materially affect the results at module level.

More information:

All other upstream datasets follow the allocation rules embedded in ecoinvent 3.11. Allocation in the study follows the step-wise procedure of EN 15804 and PCR 2019-14: whenever possible unit processes were split; otherwise, burdens were distributed by physical relationships (mass).

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

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EUR	SE	SE	-	-	-	-	-	-	-	-	-	SE	SE	SE	SE	SE
Share of primary data	66,6%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

Declaration of data sources, reference years, data categories and share of primary data:

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Raw materials (A1)	Collected data, database	EPD owner, Ecoinvent v3.11	2025	Secondary data	0%
Transport of raw materials to production facility (A2)	Collected data, database	EPD owner, Ecoinvent v3.11	2025	Primary data	64%
Production process (A3)	Collected data, database	EPD owner, Ecoinvent v3.11	2025	Primary data, secondary data	2,6%
Total share of primary data, of GWP-GHG results for A1-A3					66,6%

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Use of Fair data with more than 30 % of a core impact: The dataset used for primary brass in module A1 is assessed as having fair geographical representativeness, as it represents Switzerland while the actual supply chain involves suppliers mainly in Sweden and other European countries with similar production conditions. Due to lack of more specific datasets, this is considered an appropriate proxy. Given similar technologies and regulatory frameworks within Europe, deviations are not expected to significantly influence results. It has 74 % of the acidification impact and 73 % to 12 % of other core impacts. No use of Poor or Very Poor relevant data, no EPD used as input in model. Data quality assessed according to EN 15804:2012+A2:2019, Annex E.

Primary plant data (energy, fuels, outputs) were collected for the full reference year 2025; all are less than 3 years old. All other secondary datasets are ecoinvent 3.11 “cut-off U” or supplier-specific mixes with adapted electricity.

Infrastructure and capital goods:

Site buildings, laboratory equipment and mobile plant are excluded because their contribution is < 1 % of any impact indicator. Generic ecoinvent datasets include upstream infrastructure for electricity generation and fuel production; these were excluded. As the GWP-GHG impact from the construction of the power plant generating the electricity used in A3 was less than 1%, it was excluded from the analysis.

Climate impact of purchased electricity (A3):

Nordic Brass Gusum AB purchases electricity under an energy supply agreement based entirely on nuclear power. In the table below the GWP-GHG per kWh electricity is presented.

Impact from 1 kWh electricity		
Indicator	Unit	A3
GWP-GHG ¹	kg CO ₂ eq.	7,61E-03

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

ENVIRONMENTAL PERFORMANCE

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Mandatory impact category indicators according to EN 15804

Impact categories for 1 kg Brass Bar analyzed. EN 15804 + A2 V1.00 / EF 3.1 normalization and weighting set.

Results per 1 kg Brass Bar							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	1,94E+00	3,99E-04	1,52E-02	7,69E-04	2,83E-02	-3,28E+00
GWP-fossil	kg CO ₂ eq.	1,91E+00	3,99E-04	1,52E-02	7,59E-04	3,60E-03	-3,25E+00
GWP-biogenic	kg CO ₂ eq.	2,65E-02	8,07E-08	1,04E-05	2,83E-06	2,47E-02	-2,20E-02
GWP-luluc	kg CO ₂ eq.	2,45E-03	4,08E-08	5,04E-06	7,57E-06	2,08E-06	-4,95E-03
ODP	kg CFC 11 eq.	3,80E-08	5,92E-12	3,32E-10	1,24E-11	2,01E-11	-3,08E-08
AP	mol H ⁺ eq.	2,45E-02	3,56E-06	4,89E-05	6,60E-06	1,05E-05	-2,32E-01
EP-freshwater	kg P eq.	1,06E-04	1,39E-09	1,11E-07	4,71E-09	2,72E-07	-1,05E-03
EP-marine	kg N eq.	2,60E-03	1,66E-06	1,63E-05	2,98E-06	9,30E-05	-1,18E-02
EP-terrestrial	mol N eq.	3,19E-02	1,82E-05	1,79E-04	3,28E-05	3,15E-05	-1,69E-01
POCP	kg NMVOC eq.	1,07E-02	5,43E-06	7,41E-05	9,74E-06	1,49E-05	-4,74E-02
ADP-minerals&metals*	kg Sb eq.	3,87E-04	1,42E-10	5,13E-08	1,47E-09	1,60E-09	-3,25E-03
ADP-fossil*	MJ	4,00E+01	2,02E-04	1,70E-02	9,43E-03	3,06E-03	-1,96E+01
WDP*	m ³	7,83E-01	1,11E-05	8,37E-04	1,42E-04	2,00E-04	-3,74E+00
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 on these results are high or as there is limited experienced with the indicator.

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Additional mandatory and voluntary impact category indicators

Results per functional or declared unit							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG ²	kg CO ₂ eq.	1,91E+00	3,99E-04	1,52E-02	7,67E-04	3,60E-03	-3,25E+00
Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017							

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.

Resource use indicators

Results per 1 kg Brass Bar							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	2,51E+00	3,27E-05	3,51E-03	5,92E-03	1,54E-03	-9,10E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,51E+00	3,27E-05	3,51E-03	5,92E-03	1,54E-03	-9,10E+00
PENRE	MJ	4,02E+01	2,12E-04	1,77E-02	9,46E-03	3,11E-03	-2,06E+01
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	4,02E+01	2,12E-04	1,77E-02	9,46E-03	3,11E-03	-2,06E+01
SM	kg	3,56E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	1,49E+01	2,43E-04	2,26E-02	7,24E-02	1,81E-02	-5,11E+01
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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water						

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.

² This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Waste indicators

Results per 1 kg Brass Bar							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Output flow indicators

Results per 1 kg Brass Bar							
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	3,56E-05	0,00E+00	0,00E+00	0,00E+00	9,50E-01	0,00E+00
Materials for energy recovery	kg	1,91E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Additional 100% scenarios at end of life

The tables below represent 100% recycling scenario and 100% landfill scenario for modules C1-C4 and D.

Results per 1 kg Brass Bar						
Indicator	Unit	100 % material recycling				
		C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	3,99E-04	1,52E-02	8,10E-04	0,00E+00	-3,66E+00
GWP-fossil	kg CO2 eq.	3,99E-04	1,52E-02	7,99E-04	0,00E+00	-3,63E+00
GWP-biogenic	kg CO2 eq.	8,07E-08	1,04E-05	2,98E-06	0,00E+00	-2,46E-02
GWP-luluc	kg CO2 eq.	4,08E-08	5,04E-06	7,97E-06	0,00E+00	-5,54E-03
ODP	kg CFC 11 eq.	5,92E-12	3,32E-10	1,30E-11	0,00E+00	-3,44E-08
AP	mol H+ eq.	3,56E-06	4,89E-05	6,94E-06	0,00E+00	-2,60E-01
EP-freshwater	kg P eq.	1,39E-09	1,11E-07	4,96E-09	0,00E+00	-1,17E-03
EP-marine	kg N eq.	1,66E-06	1,63E-05	3,13E-06	0,00E+00	-1,32E-02
EP-terrestrial	mol N eq.	1,82E-05	1,79E-04	3,45E-05	0,00E+00	-1,89E-01
POCP	kg NMVOC eq.	5,43E-06	7,41E-05	1,03E-05	0,00E+00	-5,30E-02
ADP-minerals&metals*	kg Sb eq.	1,42E-10	5,13E-08	1,55E-09	0,00E+00	-3,64E-03
ADP-fossil*	MJ	2,02E-04	1,70E-02	9,93E-03	0,00E+00	-2,19E+01
WDP*	m3	1,11E-05	8,37E-04	1,49E-04	0,00E+00	-4,18E+00
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					

Results per 1 kg Brass Bar						
Indicator	Unit	100 % landfill				
		C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	3,99E-04	1,52E-02	0,00E+00	5,65E-01	0,00E+00
GWP-fossil	kg CO2 eq.	3,99E-04	1,52E-02	0,00E+00	7,19E-02	0,00E+00
GWP-biogenic	kg CO2 eq.	8,07E-08	1,04E-05	0,00E+00	4,93E-01	0,00E+00
GWP-luluc	kg CO2 eq.	4,08E-08	5,04E-06	0,00E+00	4,16E-05	0,00E+00
ODP	kg CFC 11 eq.	5,92E-12	3,32E-10	0,00E+00	4,02E-10	0,00E+00
AP	mol H+ eq.	3,56E-06	4,89E-05	0,00E+00	2,09E-04	0,00E+00
EP-freshwater	kg P eq.	1,39E-09	1,11E-07	0,00E+00	5,44E-06	0,00E+00
EP-marine	kg N eq.	1,66E-06	1,63E-05	0,00E+00	1,86E-03	0,00E+00
EP-terrestrial	mol N eq.	1,82E-05	1,79E-04	0,00E+00	6,31E-04	0,00E+00
POCP	kg NMVOC eq.	5,43E-06	7,41E-05	0,00E+00	2,97E-04	0,00E+00
ADP-minerals&metals*	kg Sb eq.	1,42E-10	5,13E-08	0,00E+00	3,20E-08	0,00E+00
ADP-fossil*	MJ	2,02E-04	1,70E-02	0,00E+00	6,12E-02	0,00E+00
WDP*	m3	1,11E-05	8,37E-04	0,00E+00	4,01E-03	0,00E+00
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					

Product variations vs declared average

There are variations in the zinc content between different production batches. To assess the impact of this variation, a sensitivity analysis was carried out comparing batches with different zinc compositions, including cases with high share of primary zinc.

Values are reported in EN 15804+A2/EF 3.1 units for each indicator. To clearly illustrate the effect of zinc content variability, a comparison has been made between the base case and the batches representing the lowest and highest impacts. The results show how differences in zinc composition influence the environmental performance across the assessed impact categories.

Indicator	Unit	A1-A3 MAX	Average A1-A3	Deviation %
GWP-total*	kg CO2 eq.	2,06E+00	1,94E+00	+6,19%
GWP-fossil*	kg CO2 eq.	2,04E+00	1,91E+00	+6,81%
GWP-biogenic*	kg CO2 eq.	2,22E-02	2,65E-02	-16,23%
GWP-luluc*	kg CO2 eq.	2,69E-03	2,45E-03	+9,80%
ODP*	kg CFC 11 eq.	4,08E-08	3,80E-08	+7,37%
AP**	mol H+ eq.	2,44E-02	2,45E-02	-0,41%
EP-freshwater*	kg PO4 ³⁻ eq.	1,03E-04	1,06E-04	-2,83%
EP-marine*	kg N eq.	2,82E-03	2,60E-03	+8,46%
EP-terrestrial*	mol N eq.	3,54E-02	3,19E-02	+10,97%
POCP*	kg NMVOC eq.	1,16E-02	1,07E-02	+8,41%
ADP-minerals&metals**	kg Sb eq.	4,31E-04	3,87E-04	+11,37%
ADP-fossil**	MJ	4,05E+01	4,00E+01	+1,25%
WDP**	m3	7,86E-01	7,83E-01	+0,38%

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
PCR	Product Category Rules
c-PCR	Complementary Product Category Rules
CEN	European Committee for Standardization
CLC	Co-location centre
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
GRI	Global Reporting Initiative
Environmental Impact Indicators (EN 15804)	
GHG	Greenhouse gas
GWP	Global Warming Potential (kg CO ₂ eq.)
GWP-fossil	Global Warming Potential from fossil sources (kg CO ₂ eq.)
GWP-biogenic	Global Warming Potential from biogenic sources (kg CO ₂ eq.)
GWP-luluc	Global Warming Potential from land use and land use change (kg CO ₂ eq.)
GWP-total	Total Global Warming Potential (kg CO ₂ eq.)
GWP-GHG	Global Warming Potential for greenhouse gases (kg CO ₂ eq.)
ODP	Ozone Depletion Potential (kg CFC-11 eq.)
AP	Acidification Potential (mol H ⁺ eq.)
EP	Eutrophication Potential
EP-freshwater	Freshwater eutrophication potential (kg P eq.)
EP-marine	Marine eutrophication potential (kg N eq.)
EP-terrestrial	Terrestrial eutrophication potential (mol N eq.)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq.)
ADP	Abiotic Depletion Potential
ADP-minerals&metals	Abiotic depletion potential for non-fossil resources (kg Sb eq.)
ADP-fossil	Abiotic depletion potential for fossil resources (MJ)
WDP	Water Deprivation Potential (m ³)
Resource Use Indicators	
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)
PERM	Use of renewable primary energy resources used as raw materials (MJ)
PERT	Total use of renewable primary energy resources (MJ)
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ)
PENRM	Use of non-renewable primary energy resources used as raw materials (MJ)
PENRT	Total use of non-renewable primary energy resources (MJ)
SM	Use of secondary material (kg)
RSF	Use of renewable secondary fuels (MJ)
NRSF	Use of non-renewable secondary fuels (MJ)
FW	Use of net fresh water (m ³)
Waste Indicators	
HW	Hazardous Waste (disposed) (kg)
NHW	Non-Hazardous Waste (disposed) (kg)
RW	Radioactive Waste (disposed) (kg)
Output Flow Indicators	
CFR	Components for Reuse (kg)
MR	Material for Recycling (kg)

MER	Materials for Energy Recovery (kg)
Lifecycle Stages / Modules	
A1	Raw material supply
A2	Transport
A3	Manufacturing
C1	Deconstruction/Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse-Recovery-Recycling potential
Other Relevant Terms	
SVHC	Substances of Very High Concern
EC No.	European Community Number
CAS No.	Chemical Abstracts Service Number
MJ	Megajoule
kg	Kilogram
m ³	Cubic Meter
NM VOC	Non-Methane Volatile Organic Compounds
Sb eq.	Antimony Equivalents
P eq.	Phosphorus Equivalents
N eq.	Nitrogen Equivalents
CFC-11 eq.	Chlorofluorocarbon-11 Equivalents
CO ₂ eq.	Carbon Dioxide Equivalents
kg C	Kilograms of Carbon
kg CO ₂ eq.	Kilograms of Carbon Dioxide Equivalent
ND	Not Declared
RAP	Reclaimed asphalt pavement

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VERSION HISTORY

Original Version of the EPD, 2026-07-03

