

Environmental Footprint Declaration

Aurubis Tin



This document presents an environmental footprint declaration based on the results of a life cycle assessment (LCA) of Aurubis tin, developed in accordance with ISO 14040 and ISO 14044 standards and the principles of ISO 14025. No applicable Product Category Rules (PCR) were available at the time of publication.

1. General information

Product name	Aurubis M-brand tin
Declared unit	1 metric ton of >99.95 % tin (ingot)
Manufacturer	Aurubis
Production site(s)	Aurubis plant in Beerse, Belgium
LCA	Aurubis supported by Sphera
Publication date	13/10/2025
Time coverage	Reference calendar year 2024
Independent verifier	TÜV NORD CERT Prüf- und Umweltgutachtergesellschaft mbH
Review type	Critical review per ISO 14044 (Clause 6)

2. Methodology and scope

Applied standards/guidelines: The study was conducted in accordance with the ISO 14040 (ISO 14040:2021 Environmental management — Life cycle assessment — Principles and framework) and ISO 14044 (ISO 14044:2021 Environmental management — Life cycle assessment — Requirements and guidelines) LCA standards and the Environmental Footprint impact assessment method (3.1). The study is consistent with the methodology adopted by the International Tin Association.

Functional unit: 1 metric ton of >99.95 % tin (ingot) at plant gate.

System boundaries: Cradle-to-gate life cycle inventory from the extraction of raw materials to the production of tin ingot. Excludes packaging, downstream use, and end-of-life.

Allocation procedures: Economic allocation was applied in the life cycle inventory of tin ingots to fairly account for co-products from copper smelting and lead-tin refining.

3. Product

Product description: Aurubis M-brand tin is a high-purity tin product, refined from secondary raw materials using advanced recycling and smelting technologies. Because of its low lead content (below 100 ppm Pb), it is ideally suited for applications requiring consistently high-grade feedstock.

Technical properties/applications: Aurubis M-brand tin exhibits excellent electrical conductivity and corrosion resistance, making it essential for solder products used in semiconductors, 5G electronics, electric vehicles, and solar PV systems. It is also used in tinplate for food packaging, copper alloys, battery grids (lead-acid and lithium-ion), float glass coatings, PVC stabilizers, and other chemical industry applications.

Expected service life: 50+ years (dependent on downstream application, e.g., in electronics, renewable energy systems, or industrial)

4. Environmental performance — impact results (per 1 metric ton tin)

Impact category	Unit	Result
Climate change	kg CO ₂ eq	2,559
Ozone depletion	kg CFC-11 eq	0.000000006
Human toxicity, cancer effects ¹	CTUh	0.000006
Human toxicity, non-cancer effects ¹	CTUh	0.00005
Particulate matter	Disease incidences	0.0001
Ionizing radiation	kBq U235 eq	691.5
Photochemical ozone formation	kg NMVOC eq	8.3
Acidification	mol H+ eq	10.8
Eutrophication (terrestrial)	mol N eq	36.6
Eutrophication (freshwater)	kg P eq	0.001
Eutrophication (marine)	kg N eq	3.36
Ecotoxicity (freshwater) ¹	CTUe	7,661
Land use ¹	Pt	2,669
Water use	m ³ world eq	348
Resource use, energy carriers	MJ	62,502
Resource use, mineral and metals ¹	kg Sb eq	0.00017

¹ Impacts are not sufficiently robust and accurate to be used for metals.

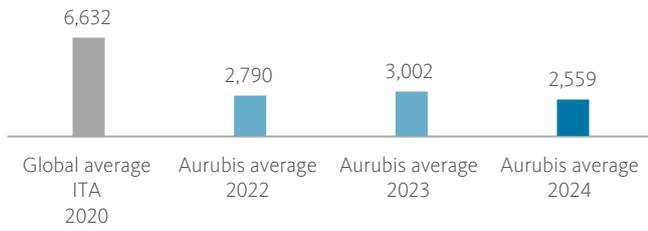
5. Environmental performance improvement and comparison with global average

The following graphs show the environmental improvements achieved by the company between 2022, 2023 and 2024 for tin ingot production.

They also compare the carbon footprint of Aurubis tin ingot with global average values. Global average data was sourced from the International Tin Association.

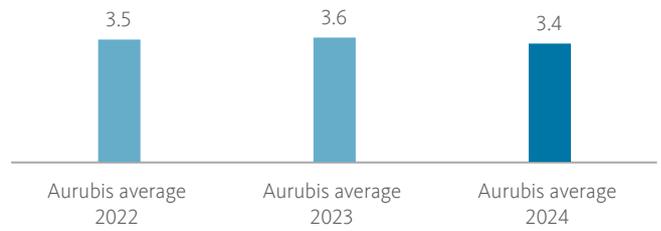
Carbon footprint

in kg CO₂ eq/t Sn



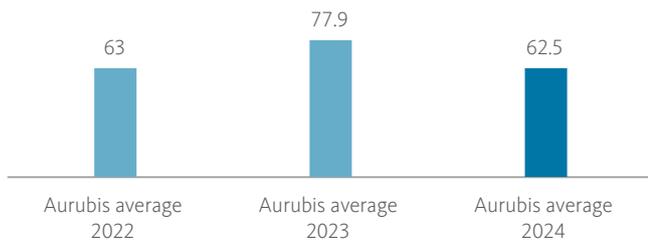
Eutrophication, marine

in kg N eq/t Sn



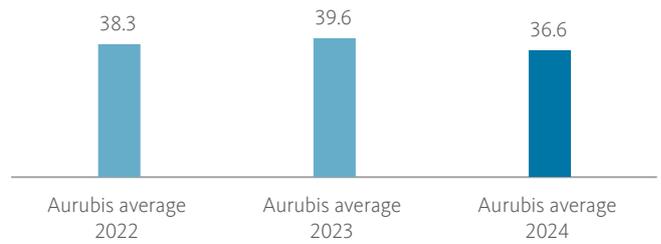
Resource use, fossils

in GJ/t Sn



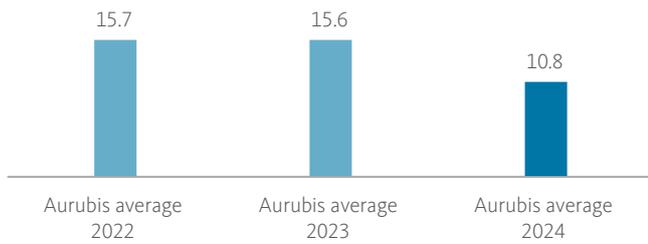
Eutrophication, terrestrial

in mole N eq/t Sn



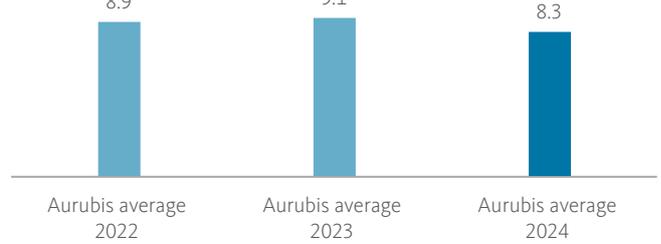
Acidification

in mole H⁺ eq/t Sn



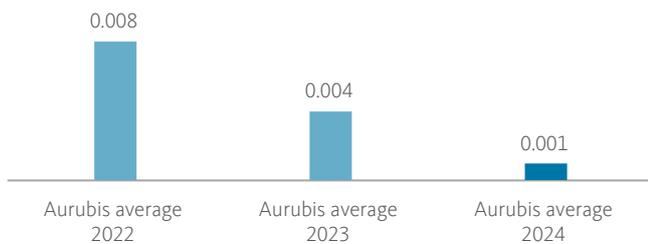
Summer smog

in kg NMVOC eq/t Sn



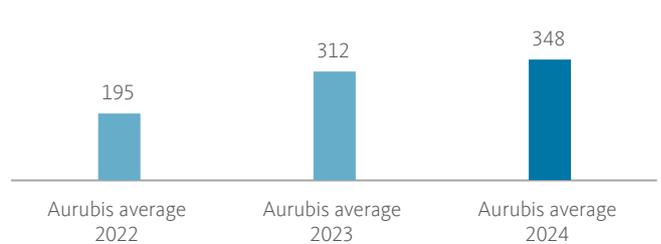
Eutrophication, freshwater

in kg P eq/t Sn



Water use

m³ world eq/t Sn



6. Additional environmental information

Recycled content: The recycled content of the Aurubis product tin ingot for calendar year 2024 was 100 %. The recycled content has been verified by TÜV Nord Cert based on ISO 14021.

Environmental labels/Certifications: Aurubis Beerse, the tin ingot producing site, is certified to ISO 14001 and ISO 50001. Aurubis Beerse is certified in accordance with the Responsible Minerals Assurance Process Standard for Tin.

7. Interpretation and conclusions

Aurubis Beerse produces its tin ingots entirely from secondary raw materials, resulting in significantly lower environmental impacts compared to the global industry average.

The main contributors to the carbon footprint are purchased electricity and transport, while direct emissions play a smaller role. The carbon footprint of Aurubis tin is significantly lower than the footprint of the industry average. The updated environmental impact of Aurubis tin for 2024 is lower than the profile from the previous years for most of the impact categories. This is mainly due to lower direct emissions. Higher water use in 2024 and 2023 was driven by a higher contribution from hydropower in the electricity mix.

8. Verification

Verification type	Critical review in accordance with ISO 14040 (2021) and ISO 14044 (2021)
Verifier name & organization	Dr. Winfried Hirtz, Michael Sommer TÜV NORD CERT Prüf- und Umweltgutachtergesellschaft mbH Am TÜV 1, 30519 Hannover, Germany Phone +49 (0) 511 986-1172 Email whirtz@tuev-nord.de; micsommer@tuev-nord.de
Date of verification	2/10/2025

The review confirmed that the LCA complies with the applicable standards and is scientifically and technically valid.

9. Disclaimer

This declaration has not been issued under a program operator and has not been verified in accordance with a PCR because none is available. The information is provided for transparency and B2B communication purposes.

10. Annexes

- A. LCA Report
- B. Benchmarking information: International Tin Association (ITA), Life cycle assessment of average tin production, ref. year 2020, <https://www.internationaltin.org/ita-publishes-new-lifecycle-assessment-of-tin-production/>