

# Environmental Profile of Aurubis SHAPES

## Copper's contribution to sustainable development

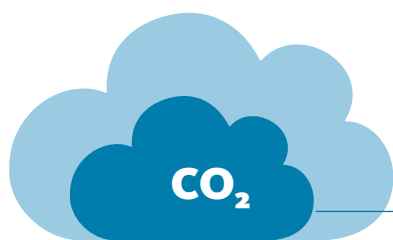
Copper is a key material to enable important technological developments, such as generating and transmitting renewable energy or advancing motors and transformers with regard to more energy efficiency. These developments are essential to reach the objectives of the European Green Deal, particularly for a clean energy transition. As a preliminary product, our Aurubis SHAPES (billets and cakes) offer the optimal starting product for fabricating high-quality flat rolled products (e.g. cable strip or lead frames) and extruded products (e.g. industrial tube for air conditioners). With its uniform high electrical and thermal conductivity, the Aurubis SHAPES ensure the highest possible efficiency in converting and transmitting electrical power or heat.

## The environmental footprint of Aurubis SHAPES

As the EU places more and more emphasis on green technologies needed to meet its climate targets, it is increasingly important to understand the life cycles of the underlying products. Aurubis takes responsibility for the global challenges of climate change, environmental protection, and resource conservation. Improving the environmental performance of products, along with enhancing sustainability throughout the entire supply chain, is of great importance for Aurubis. To underline our commitment to stay best in class in all sustainability challenges, we introduced our label "Tomorrow Metals by Aurubis" in 2021 that encompasses the many measures we are taking to enhance our sustainability performance. Hence, Aurubis is at the forefront of industries committed to reducing the environmental impact of its operations: We have set the objective of achieving carbon-neutral production well before 2050.

## Carbon footprint of Aurubis SHAPES

in kg CO<sub>2</sub> equivalents per t of shapes<sup>1</sup>



**2,320**

Aurubis SHAPES (data reference 2021)

## Life cycle assessment for Aurubis SHAPES

Responding to requests from end-users, along with our own sustainability goals, Aurubis conducted a life cycle assessment (LCA) of our copper shapes. In this holistic approach, we considered all steps involved in the production of Aurubis SHAPES - starting from the extraction of the copper ore (cradle) through the manufacturing of the copper cathode and

its further processing into Aurubis SHAPES (gate). The assessment includes impacts from all activities related to raw materials, direct emissions, transport, energy consumption, and auxiliary materials. The study was conducted in conformance with the ISO standards 14040 and 14044 for life cycle assessment<sup>2</sup>.

<sup>1</sup> Aurubis, supported by Sphera, Report: Life Cycle Assessment of Copper Shapes, Oct. 2022; results according to CML impact assessment methodology (CML 2001, update August 2016); data reference 2021.

<sup>2</sup> ISO 14040:2021 Environmental management — Life cycle assessment — Principles and framework  
ISO 14044:2021 Environmental management — Life cycle assessment — Requirements and guidelines.

## The results

The results of the environmental footprint of the Aurubis SHAPES are directly related to the copper cathodes. The key environmental aspects were assessed along a set of impact categories.

These impact categories were selected because they represent a broad range of environmental impacts and are

each determined by a well-established scientific approach. The results below are based on the CML impact assessment methodology (CML 2001, update August 2016).

## Verification

The environmental profile of the Aurubis SHAPES have been verified by TÜV Nord Cert in accordance with DIN EN ISO 14040:2021 and DIN EN ISO 14044:2021.



## How we got there: Improvements by constantly implementing environmental and climate measures

In the LCA, our goal was to evaluate the environmental profile of Aurubis SHAPES and allow tracking of the progress and further improvement. Aurubis produces its Aurubis SHAPES from its own cathodes as well as from raw materials from third parties. The LCA results of Aurubis SHAPES strongly depend on the environmental profile of the upstream copper cathode. The carbon footprint of the copper cathode has decreased by 35 % since 2013 and is 60 % below the global average for all copper smelters and refiners. The results achieved were only possible with major investments into measures that reach ambitious environmental standards.



### Emission reduction

The operations have taken continuous efforts for the reduction of direct emissions of pollutants such as dust as well as greenhouse gas emissions.



### Energy-efficient technologies

We invested in energy-efficient technologies for copper cathode and shapes production at all sites across the Aurubis Group, implemented measures to save energy, facilitated the switch to renewable energies, and enabled decarbonization.



### Recycling

Aurubis SHAPES are primarily manufactured from cathodes because of the very high purity specifications needed to deliver high electrical conductivity. The extension of Aurubis' recycling capacities contributed to the improvements of our overall footprint on the environment. The recycled content of Aurubis SHAPES for the financial year 2020/21 was 30 %.

### The use of Aurubis SHAPES improves the efficiency and environmental performance of multiple applications

Copper has a good environmental profile compared to potentially competing materials. Copper is the best conductor of electricity and heat, after silver, and improves the efficiency and performance of relevant applications. Using more copper saves energy and reduces CO<sub>2</sub> emissions. Copper also improves the operating efficiency of all forms of renewable energies, such as wind turbines, photovoltaic panels, tidal generation, and solar thermal systems.

### Environmental Footprint Impact assessment method (EF 3.0)

The environmental profile of Aurubis SHAPES (reference year 2021) was recalculated based on **the Environmental Footprint Impact assessment method (EF 3.0)**.

The Environmental Footprint Impact assessment method is considered the most appropriate therefore the results obtained with this method will be used in the future.

Aurubis SHAPES EF 3.0		2021
Carbon Footprint (Climate change)	kg CO <sub>2</sub> eq./t shapes	2,400
Resource use, fossils	GJ/t shapes	23.5
Acidification	Mole of H <sup>+</sup> eq./t shapes	21
Eutrophication, freshwater	kg P eq./t shapes	0.02
Eutrophication, marine	Mole of N eq./t shapes	4.0
Eutrophication, terrestrial	Mole of N eq./t shapes	43
Summer smog	kg NMVOC eq./t shapes	12
Water use	m <sup>3</sup> world eq./t shapes	500

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