

Environmental Profile of Aurubis FOXROD

Copper's contribution to sustainable development

Copper is a key material enabling important technological developments, such as generating and transmitting renewable energy and enhancing the energy efficiency of motors and transformers. These developments are essential to reach the objectives of the European Green Deal, particularly for a clean energy transition.

Aurubis FOXROD is a copper wire rod containing less than 4 ppm oxygen. In addition to extremely high conductivity, Aurubis FOXROD is also resistant to hydrogen embrittlement. It is used in safety applications and certain joining processes.

The environmental footprint of Aurubis FOXROD

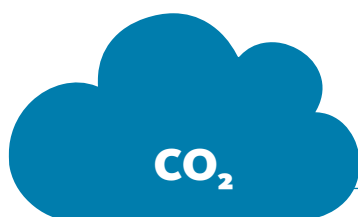
As the EU places more and more emphasis on green technologies needed to meet its climate targets, it is increasingly important to understand the life cycles of the underlying products. As a sustainably oriented multimetal company, Aurubis takes responsibility for the global challenges

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. In 2021 we introduced our label 'Tomorrow Metals by Aurubis'. It encompasses the many measures we are taking to enhance our sustainability performance. Aurubis is at the forefront of industries committed to reducing the environmental impact of their operations: We have set the objective of achieving carbon-neutral production well before 2050.

From 2023 on, the environmental impacts of Aurubis' products are only calculated via the Environmental Footprint impact assessment method (3.0) to align with best scientific and industry reporting practices. The values based on the CML (Centre for Environmental Studies at Leiden University in the Netherlands) method will not be used anymore as announced last year.

Carbon footprint of Aurubis FOXROD

in kg CO₂ equivalents per t of oxygen-free rod¹



1,140

Aurubis FOXROD (data reference 2022)

Note: The Environmental Footprint method (3.0) is the most advanced impact assessment method adopted by the European Commission. The previous version of our LCA study used the now-outdated characterization method from the Centre for Environmental Studies (CML) at Leiden University in the Netherlands.

Life cycle assessment for Aurubis FOXROD

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

cathode and its further processing into oxygen-free copper rod (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 compliance with the ISO standards 14040 and 14044 for life cycle assessment.² The oxygen-free FOXROD production is located at a single site in Olen, Belgium.

¹ Aurubis, supported by Sphera. Report: Life Cycle Assessment of Oxygen-free rod, Oct. 2023.

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

The results

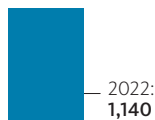
The results of the environmental footprint of Aurubis FOXROD are directly related to the footprint of copper cathodes used.

The key environmental aspects were assessed with the Environmental Footprint impact assessment method

(3.0) along 16 impact categories. The main impact categories reported in this factsheet were selected because they represent a broad range of environmental impacts. Results for all 16 indicators are available upon request. However, it is important to note that 'abiotic depletion potential' and 'toxicity' are not sufficiently robust and accurate to be used for metals.

Carbon footprint (climate change), EF 3.0

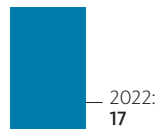
in kg CO₂ eq./t oxygen-free rod



Aurubis
average data

Resource use, fossils EF 3.0

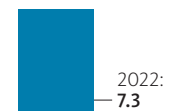
in GJ/t oxygen-free rod



Aurubis
average data

Acidification EF 3.0

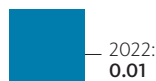
in Mole of H⁺ eq./t oxygen-free rod



Aurubis
average data

Eutrophication, fresh water EF 3.0

in kg P eq./t oxygen-free rod



Aurubis
average data

Eutrophication, marine EF 3.0

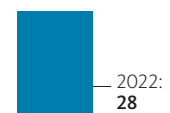
in kg N eq./t oxygen-free rod



Aurubis
average data

Eutrophication, terrestrial EF 3.0

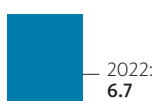
in Mole of N eq./t oxygen-free rod



Aurubis
average data

Summer smog (photochemical ozone formation) EF 3.0

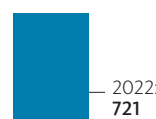
in kg NMVOC eq./t oxygen-free rod



Aurubis
average data

Water use EF 3.0

in m³ world equiv./t oxygen-free rod



Aurubis
average data

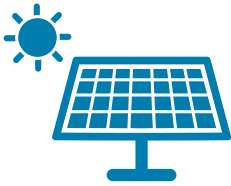
How we got there

In the LCA, our goal was to evaluate the environmental profile of Aurubis FOXROD and allow the progress and further improvement to be tracked. Aurubis FOXROD is produced from high-quality Aurubis cathodes. The LCA results for Aurubis FOXROD 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 more than 60 % below the global average for all copper smelters and refiners. The improvements achieved were only possible with major investments in measures that reach ambitious environmental standards.



Emission reduction

We have made continuous efforts to reduce direct emissions of pollutants such as dust as well as greenhouse gas emissions.



Energy-efficient technologies

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



Recycling

Wire products are primarily manufactured from copper 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 FOXROD for fiscal year 2021/22 was 69 %.

Use of Aurubis FOXROD in future technologies

Specific high-performance applications require copper that is more or less free of oxygen. This high quality level allows for flexible wires and strands for applications such as automotive ABS systems and fire-resistant cables for safety-related infrastructure. Conducting bars and flat wires for use in electrical engineering (transformers, generators, and electric motors) are also produced using Aurubis FOXROD.

Aurubis AG

Corporate Environmental Protection

Dr. Jörn Mühlenfeld

Environmental Manager
Corporate Environmental Protection
j.muehlenfeld@aurubis.com

Daniela Cholakova

Environmental Manager
Corporate Environmental Protection
d.cholakova@aurubis.com