FACTSHEET

# Hamburg Plant: Emission Facts & Figures

## At home on the Elbe island Peute

Aurubis AG's Hamburg site is one of the world's most state-of-the-art primary and secondary copper smelters. Over 2,300 employees produce approximately 400,000 t of pure copper from copper ores and, in some cases, very complex recycling materials each year. As part of multi-metal recovery, other metals such as gold, silver, nickel, lead, and zinc, as well as iron silicate products and sulfuric acid, are produced.

Environmentally sound copper and multi-metal production in the middle of a large city is a considerable challenge. It requires efforts that go beyond legal stipulations because protecting the environment and the health of our neighbors and employees is the foundation for safeguarding the site. Aurubis uses the best available techniques and consistently invests in environmental protection measures.

## In focus: air

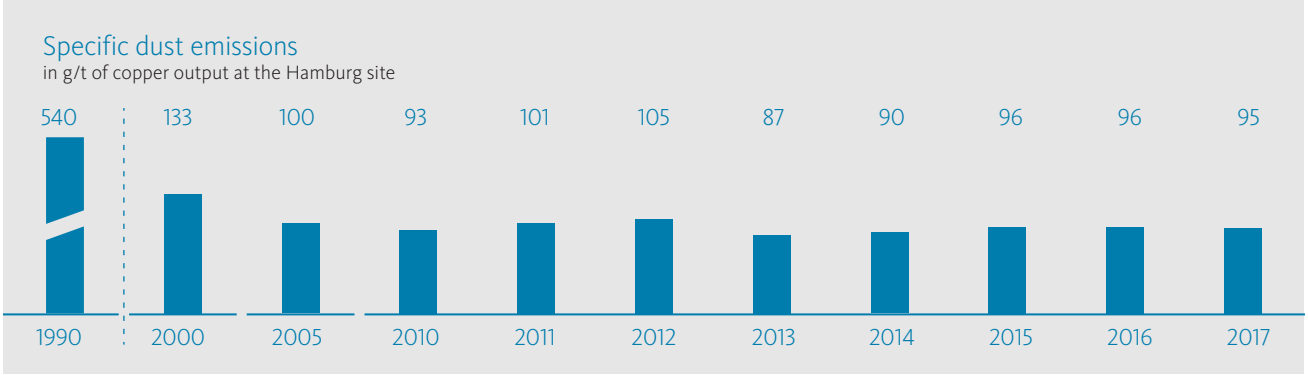
One of the most important environmental aspects at the site is the reduction of dust emissions, which are generated in metal production. The consistent use of best available techniques has led to a 29 % reduction in specific dust emissions between 2000 and 2017. Today, projects to reduce fugitive emissions have high priority. The Hamburg plant has invested more than € 220 million in environmental protection projects since 2000.

### Good to know: emissions and immissions

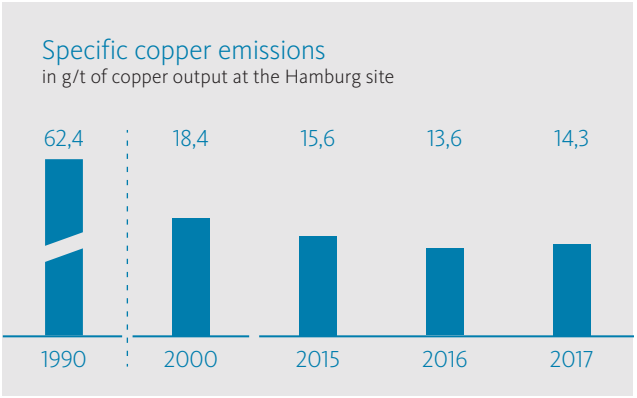
Emissions are discharges of substances that pollute the air. They can be caused by industrial plants or cars, for example. Emissions can be minimized but not completely avoided. The impacts of substances that pollute the air on people and nature are referred to as immissions. The key legal foundation regulating immissions in Germany is the Federal Immission Control Act (abbreviated in German as BImSchG).

## Development of the main emissions at the Hamburg plant*

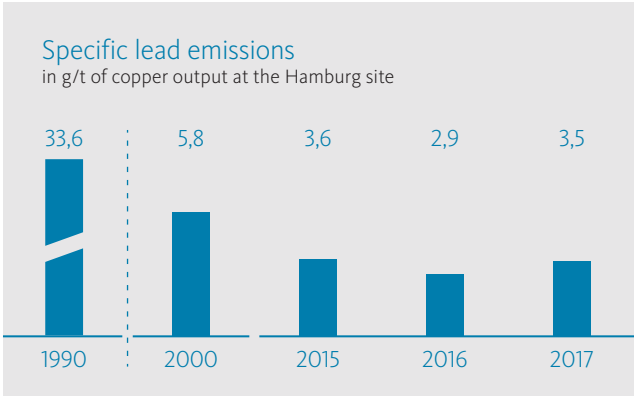
As part of environmental monitoring, emission measurements are continuously carried out at Aurubis in Hamburg and monitored by the supervisory authorities. Furthermore, about 10,000 individual analyses take place annually for air alone. The 2018 figures for emissions to the atmosphere are currently being validated. What is already clear: The legal emission limits were adhered to in 2018 again.



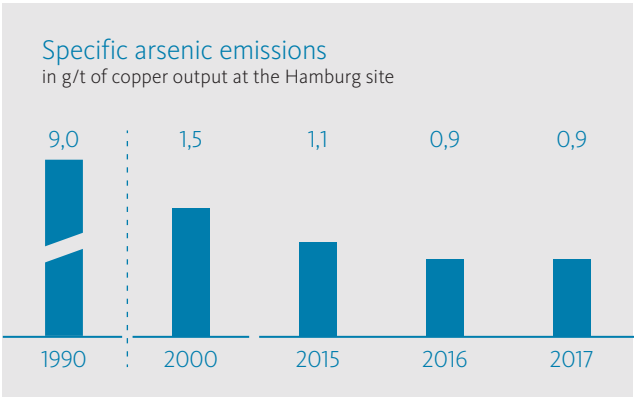

Aurubis Hamburg's figures have fallen below 100 g/t since 2013. Nevertheless, Aurubis' objective is to continue reducing the already low emission level. An important starting point is the reduction of fugitive dust emissions. Compared to the year 2000, specific dust emissions decreased by 29 % until 2017. Emissions remained constant relative to the previous year.



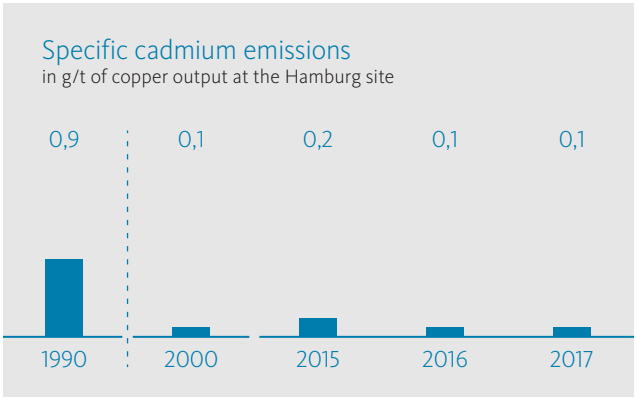

Copper is the main metallic substance in the dust at the production site. Specific copper emissions have been reduced by 22 % since 2000.




Specific lead emissions were reduced by 40 % from 2000 to 2017 and are therefore still at a low emission level.




Arsenic emissions have been reduced by 40 % since 2000 in various steps of the copper refining process.

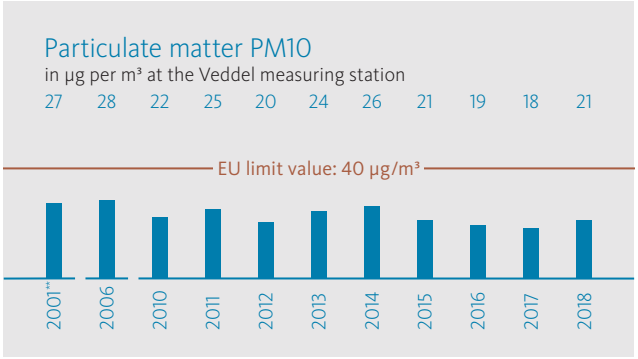



Specific cadmium emissions have been reduced by 89 % since 1990 and have been at a low level since 2000.

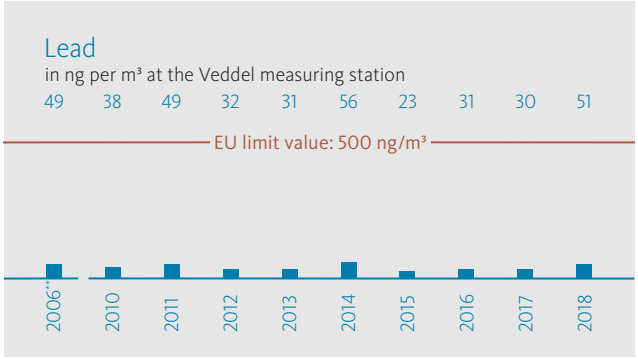
* Data: Aurubis

## Development of immissions at the Veddel measuring station*

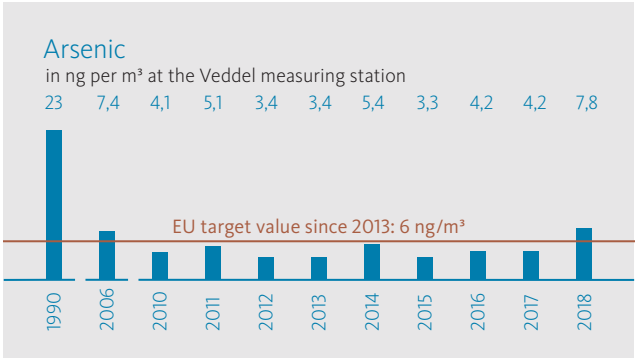
The particulate matter (PM10) load is measured at the Veddel measuring station (20VE). The ambient air on site is influenced by industrial activities, energy generation, shipping, and ongoing construction, as well as street, rail, and air traffic. Since 2012, this measuring station of the Hamburg Air Quality Measurement Network has been significant for the official air quality measurements in Veddel. It is located in close proximity to the plant premises, directly to the west.



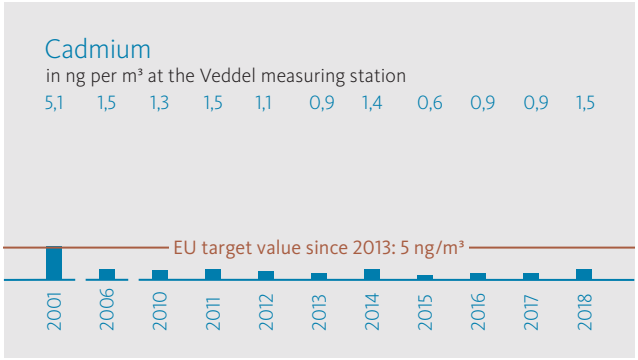

Particulate matter values and their contents are also strongly influenced by meteorological conditions. In 2018, the particulate matter values measured in the entire Hamburg metropolitan area were higher than in 2017, including at measuring station 20VE. The EU limit for particulate matter was adhered to once again in 2018.




The EU limit value that has been in place for lead since 2013 has been clearly adhered to at the measuring station for many years, and 2018 was no different. There is a noticeable influence from the unique meteorological conditions.




In 2018, the target value for arsenic in particular matter in the ambient air was intermittently exceeded for the first time since 2006, according to the measurements recorded by the Hamburg environmental authority. External factors in particular should be taken into consideration as possible reasons for this – for example, the extreme dryness combined with the inversion weather conditions in 2018.




The EU limit value that has applied to cadmium since 2013 was clearly adhered to in 2018 again, at 1.5 ng/m³, despite the influence of the extraordinary weather situation.

### Good to know

Limit value: a value established based on scientific findings with the goal of avoiding, preventing, or reducing harmful impacts on human health and/or the environment overall and that may not be exceeded **within a certain period.**

Target value: a value established with the goal of avoiding, diminishing, or reducing harmful impacts on human health or the environment overall and that **possibly** has to be adhered to **within a certain period.**

Source: 2017 Hamburg Air Pollution Control Plan

* Data: Hamburg Authority for Environment and Energy; ** Year of the first measurement; 1 gram (g) = 1 million micrograms (µg ) = 1 billion nanograms (ng)

## Planned measures and projects

In the past three decades, Aurubis Hamburg has implemented extensive emission reduction programs and defined them within the scope of public-law agreements with the city of Hamburg. Aurubis has completely fulfilled the six reduction agreements with the city up to now. A draft of another agreement to reduce dust emissions is currently in preparation.

### Investments in environmental protection

New suction system for e-furnace ridge turret

The Hamburg plant has invested more than € 220 million in environmental protection projects since 2000. Current projects to further reduce emissions:

- **Optimization of the existing suction system in primary copper production (RWO):** to be implemented within the scope of the scheduled large-scale shutdown in 2019
- **Closure of the northern open storage area and relocation of the materials to the northern bulk material warehouse:** successive relocation of materials is underway; full closure planned by mid-2019
- **Program to fully suction off all RWO ridge turrets** gradually by 2023. Installation of a pilot filter will start in December 2019.

## Environmental monitoring and supervision

All significant emission sources are equipped with continuous measuring devices. Furthermore, external testing institutes regularly check the emission sources with periodic measurements. The plant also carries out its own regular checks as part of its internal monitoring. We operate an environmental management system as an instrument to monitor legally compliant operation and to support continuous improvement. This system is certified annually by TÜV pursuant to DIN ISO 14001 and EMAS. The environmental management system is part of an overarching integrated management system (IMS). Routine inspections and audits take place in the production areas to ensure they are operated correctly. The environmental authority also ensures that the facilities are properly operated in routine inspections.

In Hamburg alone, eleven employees from different departments work in environmental protection. Five of them are responsible solely for environmental monitoring and emission measurements. Understanding and awareness of environmental issues in everyday work are promoted in training sessions for about 1,000 employees annually. Managers of the production divisions are kept up to date on new developments relating to the environment in separate informational events.

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