

HEIDENHAIN

Environmental Declaration 2022



Our sustainability mission: Identify and implement goal-oriented measures

Dear Reader,

Living by corporate values is as important to HEIDENHAIN as venturing into new dimensions of accuracy. We uphold our responsibility by considering the consequences of our actions in alignment with the ideal of a sustainable company.

This applies equally to human rights, staff equality and environmental concerns under the rubric of sustainability. We fully support the Paris Agreement, the European Green Act, the German Federal Climate Change Act and the German Federal Act on Corporate Due Diligence Obligations for the Prevention of Human Rights Violations in Supply Chains.

But what does this commitment to sustainability mean in practice for the company, its staff, its customers and its suppliers? This much is clear: we face a Herculean task that cannot be tackled with uncoordinated, short-term actions. What is needed is a carefully planned sustainability strategy implemented with long-term measures and guided by a clear roadmap.

The European Eco-Management and Audit Scheme (EMAS), which has been established at HEIDENHAIN since 1996, provides an excellent underpinning. Our company's more than 25 years of accumulated knowledge about environmental factors and resource stewardship provides a solid foundation for the continuous improvement and enlargement of our sustainability strategy for the future. Fixed poles guiding us along the way are our commitment to the region and our high vertical range of manufacture.

And in alignment with our philosophy of developing strong, trusting and long-term customer relationships, we cannot limit these goals solely to HEIDENHAIN. We already offer products that provide our customers with sustainable, high-tech solutions, and we aim to expand this offering. For only if we work together will we achieve the world's challenging ecological and societal goals in an economically viable manner.

HEIDENHAIN is tackling this challenge head-on by transitioning its current management system into a comprehensive sustainability management system. In the process, our benchmark will be our guiding principles, along with all applicable laws and agreements, thereby expanding traditional HEIDENHAIN values to new and wider horizons.

Traunreut, 3/23/2022

Anna Enzinger
Executive Officer,
Member of the Management Board

Karl Landinger
Environmental Protection Officer



DR. JOHANNES HEIDENHAIN GmbH has been validated in accordance with the European Eco-Management and Audit Scheme (EMAS) since August 21, 1996.



DR. JOHANNES HEIDENHAIN GmbH has been certified in accordance with the international environmental management standard DIN EN ISO 14001 since July 31, 1996, and with the quality management standard DIN EN ISO 9001 since 1993.

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HEIDENHAIN: the company and its products

“High-tech made in Germany” is what HEIDENHAIN stands for throughout the world. For more than 125 years, the company has been a standard-setting pioneer in measurement, control and drive system technology. HEIDENHAIN products often lay the groundwork for technological advances in the most innovative global industries, including semiconductors, electronics, machine tools and production equipment automation for the factory of tomorrow. That’s because the consistent, ongoing development of accuracy, dynamic performance and process reliability for HEIDENHAIN products directly improves the performance and efficiency of machines, systems and processes used in these industries.

HEIDENHAIN develops and produces the following products:

- Linear encoders
- Angle encoders
- Rotary encoders
- Touch probes
- CNC controls
- Software solutions for the Digital Shop Floor
- Touch probes and vision systems
- Digital readouts
- Signal converters
- Inspection and testing devices

HEIDENHAIN worldwide



8600 employees



Approx. **30** sales and service centers and approx. **40** distributors



Over **25.6 million** rotary encoders and angle encoders



Over **8.1 million** linear encoders



Over **513000** digital readouts



Over **311000** controls

HEIDENHAIN controls

Day in and day out, HEIDENHAIN controls have achieved a 35-year proven track record on milling machines, lathes, drilling machines and machining centers. From standard machining tasks to complex HSC and five-axis operations, HEIDENHAIN controls support users with:

- Shop-friendly Klartext programming
- Helpful images
- Practical cycles
- Smart solutions for digital data management

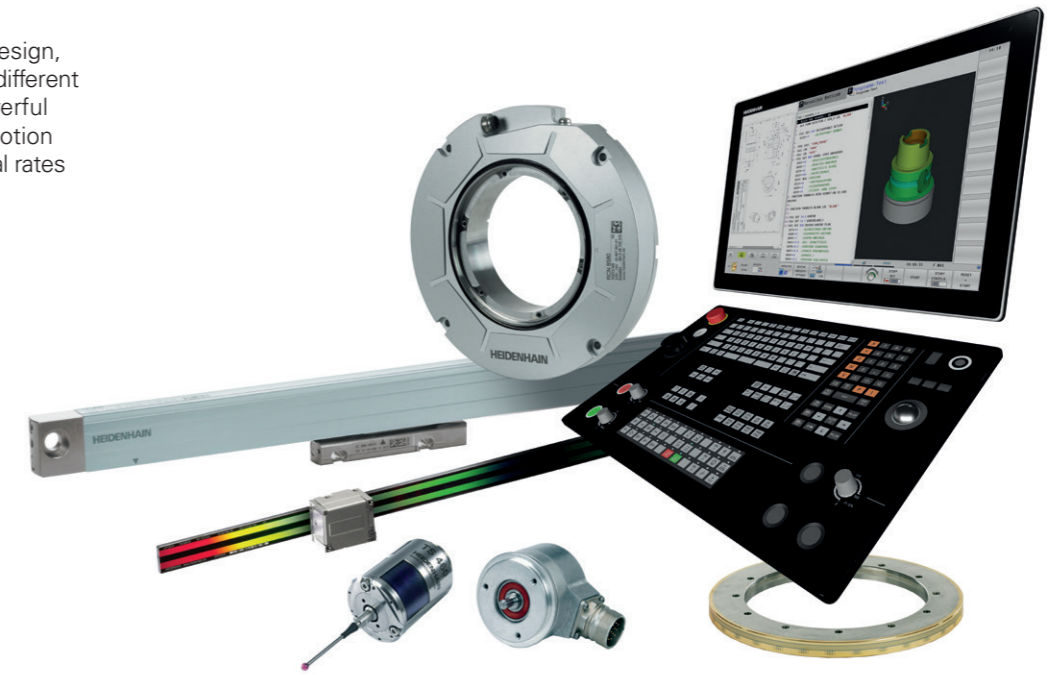
Thanks to a universal operating design, users can readily switch between different HEIDENHAIN controls. Their powerful functionality ensures optimum motion control for higher accuracy, removal rates and process reliability.

HEIDENHAIN encoders

Ensuring the high quality of HEIDENHAIN encoders requires specialized production systems and measuring equipment. Measuring standards for encoders are manufactured using processes independently developed by HEIDENHAIN and on machines largely manufactured by HEIDENHAIN. The encoder production facilities include clean rooms featuring special temperature control and vibration protection measures.

HEIDENHAIN has mastered the relevant core processes:

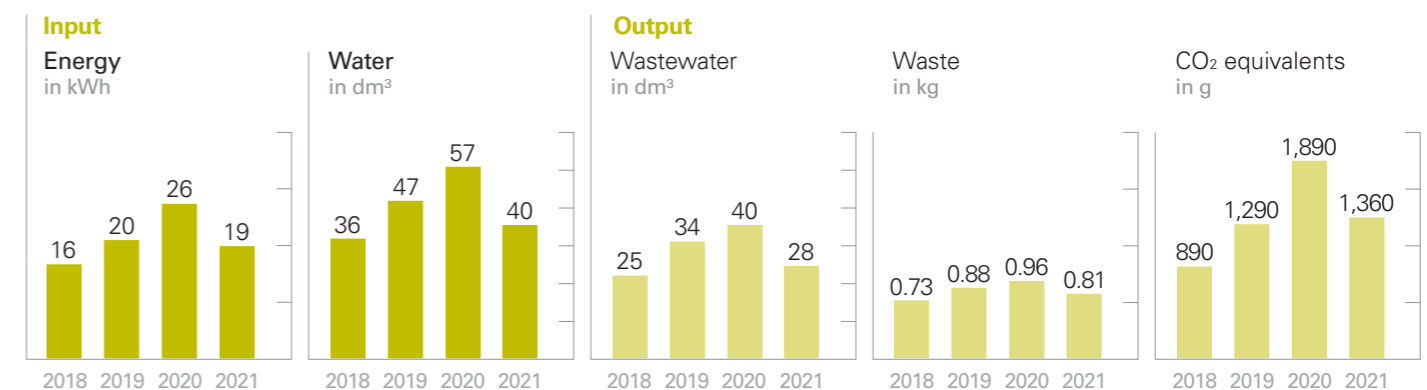
- Production of microstructures, particularly on glass or glass ceramics
- Optical, inductive and magnetic scanning principles
- Downstream processing of measured data in integrated electronics



Input-output balance

The input-output balance depicts the environmentally relevant flow of materials and energy. This provides a basis for evaluating our economic activities in terms of their impact on the environment.

Input-output statement (per kg of product)



After the increase in specific consumption in recent years, we were able to alter the trend through higher levels of production.

Production sites





Head office and main plant in Traunreut


Our headquarters: closely enmeshed R&D, production, logistics and administration


The HEIDENHAIN headquarters in Traunreut (Upper Bavaria) is the beating heart of the company. Here, the main R&D, production, logistics and administration activities are all concentrated in close proximity to each other. This ensures short distances and fast processes for immediately responding to the needs and wishes of international customers in high-tech industries, including semi-conductors, electronics or mechanical engineering.


The campus in numbers

- 

Total area
307 000 m²
- 

Approx. **71%** developed area
Approx. **17%** green area
Approx. **12%** semi-natural area
- 

4 150 employees
- 

Approx. **2.1 million** devices made in 2021
- 

4 125 t of overall output in 2021
(total weight of all products sold, with packaging)

Production methods

The exceptionally high accuracy and quality standards of HEIDENHAIN products require special production facilities including processes and machines developed in part by HEIDENHAIN itself. The main production processes are as follows:

- Basic machining and processing of metal and glass
- Production of precision optical graduations
- Assembly of printed circuit boards
- Final assembly of components and devices

Environmentally relevant processes

A small proportion of the production processes take place in facilities requiring approval in accordance with the German Federal Immission Control Act and the Water Resources Act:

- Power and heat generation in the gas-powered combined heat and power plant with a centralized furnace
- Reintroduction of waste water from glass processing

Further environmental legal requirements apply to systems that deal with water-polluting substances and to emissions containing highly volatile solvents:

- Handling, storage and transport of hazardous materials and waste

- Galvanic and chemical surface processing of optical-quality glass and steel carriers, with pH neutralization of the waste rinse water
- Manual and automated surface cleaning of semi-finished and finished products in graduation production with volatile solvents
- Operation of recooling plants as part of ventilation systems

The environmental impact described on the following pages refers to both campuses, although the predominant share (over 80%) arises at the main plant.

Hochreit campus

The HEIDENHAIN headquarters was originally concentrated on its campus in the middle of Traunreut. Today, it is supplemented by a site in Hochreit, located approximately 1 km from the main campus. Along with its metal and glass production facilities, it has housed the new logistics center since 2020.

	2018	2019	2020	2021
Energy consumption in GWh	11.1	11.6	11.7	13,0
CO ₂ emissions in metric tons	690	850	830	810
Fresh water consumption in m ³	30,000	32,000	28,000	27,000

Thanks to the significant increase in production volumes in 2021, the efficiency of the Hochreit site was improved.



Hochreit campus in Traunreut

Occupational safety and environmental protection policy

The company's occupational safety and environmental protection guidelines are the basis for ensuring staff health and safety, as well as environmental protection.

Occupational safety and environmental protection are important parts of our corporate policy. Yet even despite our best efforts, we know that our actions are not

without impact on the safety and health of our employees and the environment. The Management Board has appointed an officer responsible for introducing and implementing our safety and environmental protection policy. This person is responsible for ensuring compliance at all levels of the company.

We act in accordance with these guidelines

- 1 HEIDENHAIN shall protect and preserve the environment as essential for the existence of current and future generations.
- 2 HEIDENHAIN shall comply with all applicable environmental protection laws.
- 3 HEIDENHAIN shall comply with the environmental provisions and standards that affect its operations, act in an environmentally conscious manner at all of its sites and handle natural resources responsibly.
- 4 HEIDENHAIN shall strive to develop and use new products and production technology in order to optimize raw material requirements, reduce detrimental effects on the environment and eliminate risks to its employees.
- 5 HEIDENHAIN shall ensure that its safety systems and organizational measures are always at the current state of the art.
- 6 HEIDENHAIN shall inspect, monitor and evaluate its corporate activities for their effect on the environment and on the safety of its employees, ensuring the implementation of occupational safety and environmental protection policy through a certified environmental protection management system.
- 7 HEIDENHAIN expects its employees to actively contribute to protecting the environment.
- 8 HEIDENHAIN shall train and inform its employees in order to promote safety and sensitivity to environmental matters, both inside and outside the company.
- 9 HEIDENHAIN shall endeavor to ensure the seamless flow of information to public authorities in the context of a cooperative working relationship.
- 10 HEIDENHAIN shall inform its business partners and the public regarding the safety and environmental aspects of the company and its products.

Environmental management

The company's context

HEIDENHAIN uses an environmental protection management system to implement its core corporate policy guidelines in the form of practical measures.

In order to ensure the focused implementation of environmental protection management at HEIDENHAIN, the context of the company was determined based on stakeholder requirements. The resulting environmental factors are the basis for environmental protection goals and specific measures for continuous improvement. Within this context, any legal requirements must be fully met.

Organizational structure and process landscape

An environmental protection officer appointed by the Management Board monitors the company's compliance with its occupational safety and environmental protection policy. The environmental protection officer is supported by officers for emission control, water protection, waste and hazardous materials. The company officers monitor all environmentally relevant legal changes, evaluate them and inform any affected areas of the company in order to ensure continuous improvement and compliance with the legal requirements. No violations of environmental regulations are known to have occurred during the reporting period.

Document management for the environmental management system is performed on an electronic knowledge platform. The process landscape of the environmental management system consists of overarching process descriptions supplemented by department-specific work and operating instructions.

Ascertainment of environmental impact

The environmental impact is ascertained through consideration of the environmentally relevant corporate processes. HEIDENHAIN analyzes these effects under the aspects of auxiliary materials and supplies, waste, energy, emissions and water/soil. For every aspect, energy and material consumption are measured and the use of environmentally relevant systems are examined. The results are expressed as metrics. The corporate processes are evaluated for both normal operating procedure and for potentially occurring operational disturbances. We are aware that the consumption of resources and the disposal of waste cause air and soil pollution; that harmful emissions contribute to air pollution, summer smog and the greenhouse effect; that the consumption of energy and water accelerates the scarcity of resources; and that wastewater contaminants contribute significantly to soil and water pollution.

Key metrics

Our environmental protection goals are defined and evaluated based on metrics. Key metrics are gathered as part of determining the environmental effects for environmentally relevant processes. In order to ensure continuous improvement, the extent to which the defined environmental goals are reached is determined through the periodic review of metrics and their trends.

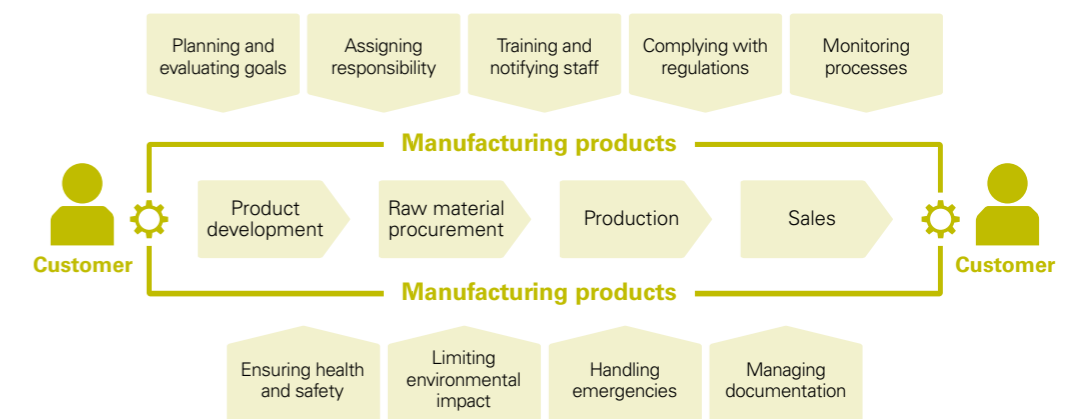
Environmental audits

Environmental audits provide periodic and systematic evaluation of environmental performance, as well as compliance with the relevant environmental regulations. All activities of the company therefore undergo a full evaluation at defined intervals of at most three years. The content of the environmental audit is documented in a summary. This summary then supports the Management Board in reviewing the suitability, reasonableness and effectiveness of an environmental management system.

The environmental audit is supplemented by periodic, department-specific internal occupational safety and environmental audits. The audits are performed by trained auditors, the relevant managerial staff, the works council and the company physician. Any discovered deviations are documented and resolved through corrective measures within the required time.

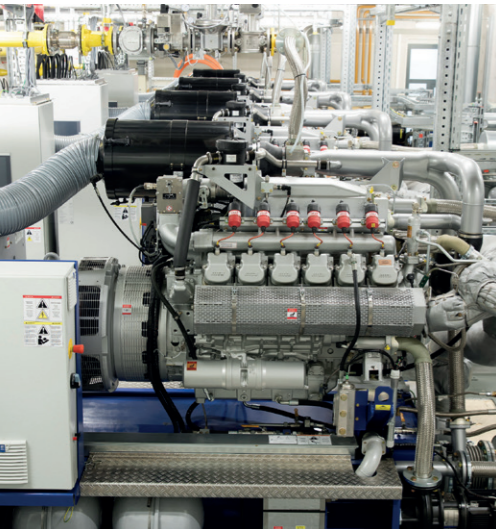
The environmental audit therefore ensures that the current environmental management system complies with the company's environmental policy.

Process landscape with essential process descriptions of the environmental management system



Environmental impact

Energy



Combined heat and power plant (CHP): low resource consumption for heat and power generation

The company's combined heat and power plant runs on natural gas. It generates heat and electricity based on the principle of cogeneration. The production of heat and power at the site of consumption leads to an excellent total utilization rate.

Coverage of electricity needs

Approximately 11% of the company's total required electricity needs are covered by the combined heat and power plant. The remaining required power is sourced from a trans-regional energy provider with 100% renewable energy.

Based on the principle of cogeneration, the combined heat and power plant produces electrical power for manufacturing facilities as well as thermal energy for the heating of buildings.

Coverage of heating needs

The combined heat and power plant is used for both heat and power generation. The heat it produces is used for heating purposes and meets more than half of the company's entire heating needs.

The company is also connected to the Traunreut district heating system, which sources its heat from a biomass heating plant and a geothermal power plant. The biomass heating plant is powered by wood chips, waste wood and natural gas. The geothermal power plant is fed with geothermal heat from hot thermal water. The proportion of renewable energy of this district heating is approximately 76%.

The remainder of the required heat energy is provided by one centralized heating furnace and multiple decentralized heating furnaces, which are primarily operated with natural gas.

The proportion of energy from renewable sources is approximately 66% of total consumption.

Limiting energy needs

HEIDENHAIN strives to reduce energy consumption and improve energy efficiency in new buildings and through energy rehabilitation in already existing buildings.

New buildings

For new buildings, the energy-efficient operation of the building is taken into consideration as early as the planning stage. In particular, the structural thermal insulation of the building envelope, as well as the energy efficiency of the building services technology for heating, ventilation, air conditioning and lighting, must meet strict legal requirements for energy conservation in buildings.

Thanks to the use of environmentally friendly and state-of-the-art technologies, such as heat recovery for air-conditioning systems, a reduction in the environmental impact was achieved for various new production buildings.

Energy rehabilitation of existing buildings

For the improvement of energy efficiency in existing buildings, care is taken that buildings and building services systems undergo energy rehabilitation as needed, subject to economic considerations. The objective is to ensure the economical and, as a result, environmentally friendly operation of already existing buildings.

Energy monitoring

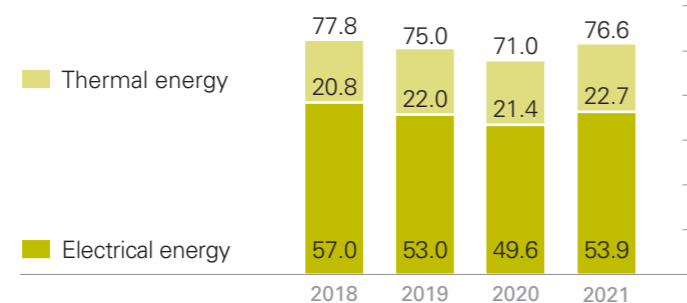
An extensive energy monitoring system that transparently tracks the energy consumption of all buildings is continually under expansion. Through continuous monitoring of the consumption rates, negative trends are easier to monitor, and specific weaknesses can be identified. The energy monitoring system thereby contributes to energy consumption optimization.



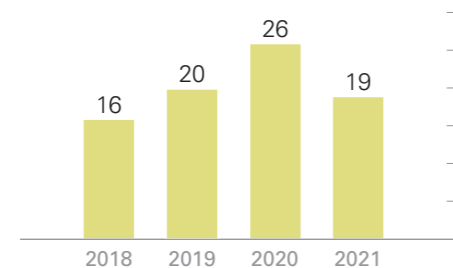
HEIDENHAIN glass scales, which feature accuracies in the micrometer range, are manufactured in the Mastering department. Our precise manufacturing processes place stringent demands on the quality and reliability of our clean-room technology.

Energy consumption

Overall in GWh



Per kg of product in kWh



Despite the rise in absolute energy consumption in 2021, the specific energy consumption was reduced.



Angle encoders exhibit accuracies at the arc second level or below, while linear encoders feature accuracies in the micrometer range or below. The special atmosphere required for their production is ensured by complex, state-of-the-art ventilation systems. Optimized optics make devices such as the RCN and LC series resistant to liquid contamination and condensation. As a result, machine manufacturers can reduce the amount of sealing air supply and considerably reduce the CO₂ footprint of their systems.



Environmental impact

Water and soil



Wastewater is inspected on a regular basis through self-checks. To date, the measured concentration levels have been significantly below the legally specified limits.

Fresh water

Approximately 163 000 cubic meters of fresh water were consumed in 2021. This freshwater is primarily needed for the required climate control of production and assembly departments, and for cleaning processes during the production of graduations. Fresh water is sourced entirely from the public mains of the Traunreut waterworks.

Wastewater

Water types and quantities

Production wastewater, sanitary sewage and rainwater must all be dealt with. Approximately 116 000 cubic meters of production wastewater and sanitary sewage were produced in 2021. The amount of sanitary sewage is calculated based on an annual average consumption rate of approximately 8 cubic meters per employee. This calculation is based on the average full-time equivalent during the reporting period.

The difference between freshwater consumption and wastewater production is due to evaporation from cooling towers and air humidifiers.

Pretreatment of wastewater

Before being discharged into the public sewage system, a portion of the produced wastewater is pretreated with the following equipment:

- Grease separators
- A light liquid separator
- Flow neutralization systems

Two grease separators treat the grease- and oil-containing rinse water from the company's own cafeteria at the main plant and the Hochreit campus. The light liquid separator treats the wastewater containing mineral oil from the company's own car-wash stations. The separator systems are operated in accordance with legal requirements.

Two flow neutralization systems are used for wastewater from the graduations production area. These systems treat and monitor the pH value of the lightly contaminated rinse water arising from graduation production.

Reintroduction into the water cycle

Rainwater from new buildings is returned to natural circulation via soakaway pits.

Wastewater pollutant load

The pollutant load from the Graduation Production department (E90 and A40) is checked annually by an accredited measuring body. The results are considerably below the prescribed limits of the municipal drainage statute. Both the organic load and the nitrogen and phosphorous load exhibit significantly smaller concentration levels than those found in household raw effluent. Other water-polluting substances, such as heavy metals, were likewise found at only very low concentrations. As a result, this water exhibits good biodegradability.

During the production of precision graduations, wastewater arises from the processing of glass and glass ceramics. Introducing this wastewater into the public wastewater system requires a permit in accordance with the German Federal Water Resources Act. The minimum requirements for introducing this wastewater are based on Appendix 41 of the German Federal Waste Water Ordinance and are defined in the relevant notice of approval. The pollutant loads

are periodically checked at two wastewater collection sites (E92 and H14) by an accredited measuring body and are below the officially prescribed wastewater limits.

Self-monitoring

Within the scope of self-monitoring in accordance with the German Federal Water Resources Act, the company's own sewer system is periodically inspected. Any occurring deficiencies are promptly resolved.

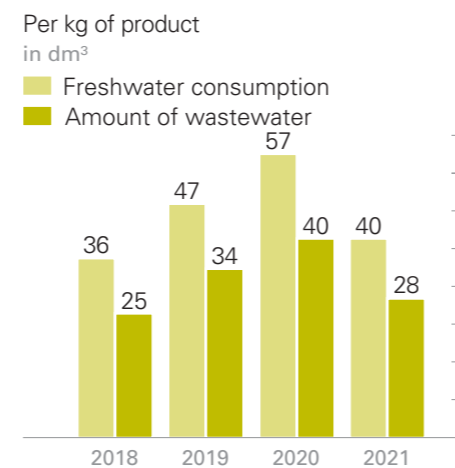
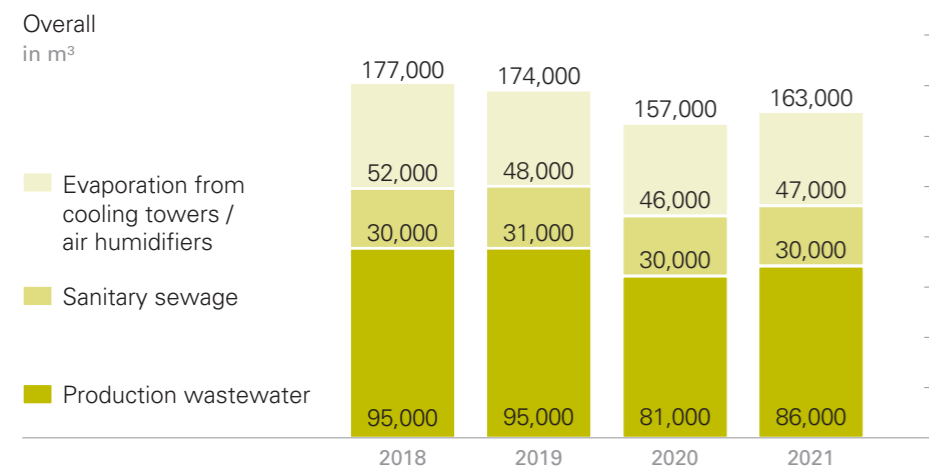
Soil protection

In the interest of protecting soil and water from hazardous pollution, sites once suspected of contamination were formerly examined for hazardous substances in accordance with the requirements of the German Federal Soil Protection Act. The company grounds are now free of areas suspected of contamination.



The continuous-flow neutralization system treats and monitors rinse water from graduation production before it is introduced into the sewer system.

Freshwater consumption / wastewater



Despite the rise in absolute water consumption in 2021, the specific water consumption was reduced.

Legal and government agency wastewater limits and measurement results

	Unit	Limit value	Measurement results
Graduation Production (E90 and A40)			
Hydrocarbons	mg/l	20	< 0.8
Zinc	mg/l	5	< 0.05
Chromium	mg/l	1	< 0.01
Nickel	mg/l	1	< 0.01
AOX	mg/l	1	< 0.1
Glass processing (E92 and H14)			
Copper	mg/l	0.3	< 0.13
Lead	mg/l	0.3	< 0.05
Arsenic	mg/l	0.3	*
Wastewater amount (E92 / H14)	m³/d	80 / 99	< 5 / < 80

The measurement results come from the measurement reports of an accredited measuring body. For both glass processing collection sites, the stated value is the maximum measured value.

* During self-monitoring, non-representative amounts of arsenic were observed multiple times due to improper sampling. After consultation with the relevant government agency and elimination of the error, no further exceedances of the limit were observed.

Environmental impact

Waste



Processing facilities chop metal chips into small pieces and withdraw moisture, thus allowing them to be economically recycled.

Waste separation, waste treatment and waste disposal

Waste separation: committed to recycling raw materials

The company produces the main following types of waste:

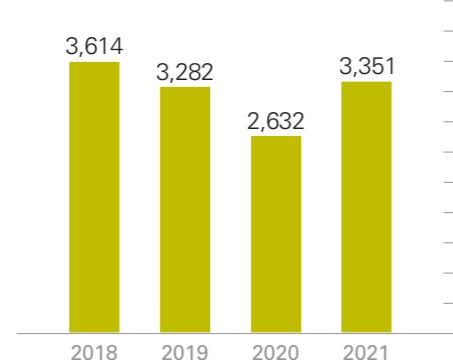
- Metal from metalworking
- Glass from graduation production
- Wastepaper from offices
- Cardboard from packaging
- Electronic waste, especially from electronics production
- Household-type commercial waste
- Hazardous waste, particularly solvent-water mixtures and cooling lubricants

Waste statistics

Waste and recyclables in metric tons

	2018	2019	2020	2021
Electronics	122	115	88	97
Glass	72	63	46	63
Commercial waste	286	247	213	284
Wood	218	194	116	148
Metal	1,307	1,035	898	1,142
Paper	293	244	191	246
Hazardous waste	934	1,021	832	985
Other waste	382	363	248	386

Overall in metric tons



Waste treatment

All waste is separately collected and properly recycled or disposed of in accordance with the requirements of the German Waste Management and Product Recycling Act and the Commercial Waste Ordinance, including the hazardous substances regulations.

Waste disposal

Thanks to its rigorous waste separation policy, HEIDENHAIN is able to recycle over 90% of its waste. Most of the waste is disposed of by regional waste management companies. Hazardous waste is primarily disposed of by GSB Sonderabfall-Entsorgung Bayern.

Building demolition

Through the controlled demolition of old commercial real estate, 2540 tons of different types of waste were produced on top of the following waste balance in 2021. Of the different types of waste, more than 80% was mineral construction waste and less than 1% was hazardous waste.

Waste reduction methods in production facilities

Processing plant for metal chips

Two processing plants for metal chips are in use; one is located on the main campus in Traunreut and the other at the Hochreit facility. The metal chips are first chopped up by a shredding unit, and residual emulsions are then removed in a centrifuge. At this point, the metal chips have a moisture content of less than 1% and can be recycled more effectively and economically. In order to avoid the transport of hazardous materials around the site, waste cooling lubricant is stored in central tanks located near the respective processing equipment.

Reduction of waste from coating processes

In the past, a protective coating was applied to the front panels of the contouring controls. Due to the increased use of stainless steel housings, these coatings are now largely not needed. The amount of waste arising from these processes has therefore been reduced.

Reduction in cooling-lubricant consumption

Through the growing use of centrifugal suction systems on encapsulated machine tools, the cooling lubricant that is carried along with the extracted emulsion and oil mists is separated and reintroduced into circulation within the given system.

Hazardous materials

The following hazardous materials arise from the company's manufacturing processes:

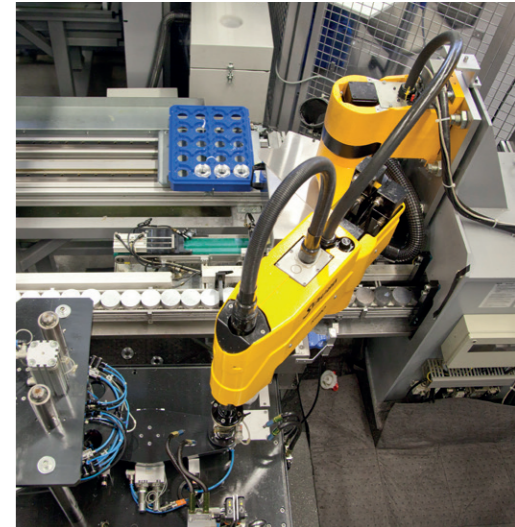
- A solvent-water mixture for the surface cleaning of semi-finished and finished products
- Waste from coating processes, adhesive residue from assembly processes and soiled cellulose cloths from cleaning activities
- Diverse waste containing acids and bases from graduation production

Measures taken

The hazardous materials are filled or packed into approved transport containers, and then declared and loaded in compliance with the applicable regulations. Employees involved in the transport of these materials monitor the packing and loading processes with the help of a checklist.

Training and monitoring

All of the employees involved in the transport of hazardous materials are trained and regularly instructed in accordance with their specific role. An external hazardous materials officer monitors compliance with the hazardous materials regulations.



Many components of HEIDENHAIN encoders are manufactured in automated production systems. In order to increase service life and reduce waste, the cooling lubricants needed for metal cutting are constantly monitored.



Rotary encoders convert rotational motion into electrical signals using the photoelectric scanning principle for position ascertainment. Cooling lubricants are used during the production of the flange, which holds the components of the rotary encoder.

Despite the rise in absolute waste production in 2021, the specific waste production was reduced.

Environmental impact

Emissions



HEIDENHAIN precision graduations have line widths ranging from 0.25 µm to 10 µm. The associated manufacturing processes (e.g., DIADUR or METAL-LUR) require special investments in buildings, climate control and process technology.

Environmentally relevant emissions

The company causes environmentally relevant atmospheric emissions primarily through the following processes:

- Gas firing of the company's combined heat and power plant
- Gas and oil combustion in the centralized and decentralized heating systems
- Chemical surface treatment of components and devices, such as for coating and cleaning processes

Odor, dust, or noise emissions are produced only in low quantities.

For the CO₂ equivalent, the anthropogenic greenhouse gases from the company's emissions sources are considered in accordance with Scope 1 of the GHG Protocol. Indirect emissions from prior and subsequent activities in accordance with Scope 2 and Scope 3 of the GHG Protocol are currently not considered.

Production of heat and electricity

The combined heat and power plant, which runs on natural gas, along with various heating systems, produce emissions that are typical of combustion processes. The carbon dioxide emissions are calculated based on approximately 25 GWh of primary energy consumption from natural gas and heating oil.

For the operation of the combined heat and power plant and the central heating system, the requirements for the relevant approval notice and the 44th Implementing Order of the German Federal Immission Control Act must be complied with. Repeated emissions measurements of the main types of emissions are necessary and must be performed by an accredited measuring body. All of the results are below the officially prescribed emissions limits.

Surface cleaning with organic solvents

The emission of volatile organic compounds (VOC) is due primarily to the cleaning of semi-finished and finished goods at various facilities and work areas. The primary cleaning agents used are alcohols and acetone.

Most of the VOC emissions arise during graduation production, which is subject to special requirements in accordance with the 31st Implementing Order of the German Federal Immission Control Act. This requires recurring emissions measurements at different exhaust-air systems by an accredited measuring body. Once again, all of the results are below the legally required emission limits.

Operation of evaporation cooling systems

Evaporation cooling systems are particularly required for climate control in buildings whose operation is subject to the 42nd Implementing Order of the German Federal

Immission Control Act. The required inspections of the hygiene standards of the raw water are performed on a regular basis in order to prevent the hazardous discharge of legionella to the outside air via aerosols.

Emissions reduction measures

The reduction of polluting emissions is a permanent environmental goal. To this end, building and production-system measures are continuously being taken in order to maintain the state of the art in minimizing emissions from heating and electricity consumption.

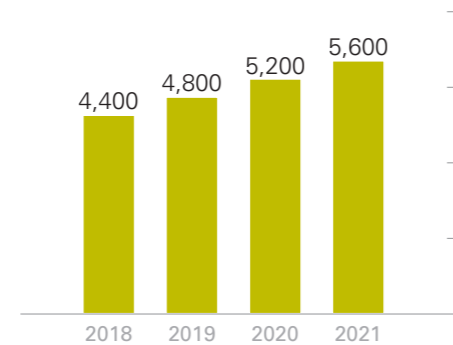
A reduction in the use of volatile organic solvents is another long-term goal of the company. The approval of more environmentally friendly replacement substances for surface cleaning is continuously being pursued, although the very high quality requirements of individual cleaning processes must be considered as well.



Solvents are chiefly used for cleaning the surfaces of semi-finished and finished products. In addition to the small amounts that enter wastewater during the rinsing processes, approximately half of the solvents are recycled. The remainder are released into the ambient air.

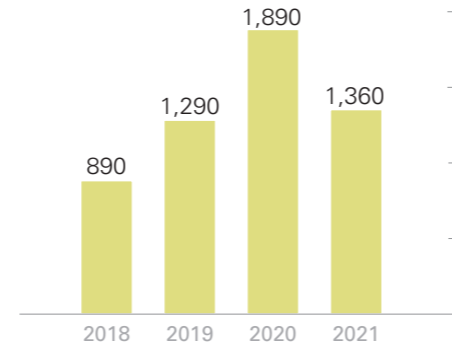
Emissions output

CO₂ equivalent in metric tons

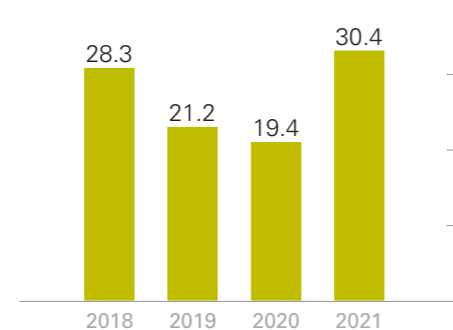


The CO₂ equivalent from sources of emissions at HEIDENHAIN has been determined in accordance with Scope 1 of the GHG Protocol since the reporting year 2020. Prior to 2020, only CO₂ emissions from combustion processes of the combined heat and power plant and the heating systems were considered.

CO₂ equivalent per kg of product in grams

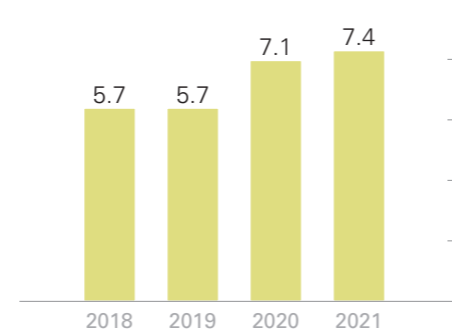


Volatile organic compounds (VOC) in metric tons



The increased VOC emissions in 2021 are due to the above-average manufacturing proportion of a product group that requires greater use of organic solvents during the production process. The updated emissions factors result in changes to the reports from previous years.

VOC emissions per kg of product in grams



Legal and government agency emission limits and measurement results

	Unit	Limit value	Measurement results
Combined heat and power plant, Modules 1 to 4			
Carbon monoxide	mg/m ³ NC	300	< 150
Nitrous oxide	mg/m ³ NC	250	< 250
Formaldehyde	mg/m ³ NC	60	< 29
Sulphur oxides	mg/m ³ NC	10	< 1
Boiler plant Boilers 1 and 2			
Nitrous oxide	mg/m ³ NC	150	< 60
Emissions loss	% NC	9	< 7
Graduation Production			
Total carbon A40 exhaust air system	mgC/m ³ NC	75	39
Total carbon E90 exhaust air system	mgC/m ³ NC	75	25
Total carbon E92 exhaust air system	mgC/m ³ NC	75	46

The measurement results (in mg/m³ NC = mg/m³ in normal condition) are taken from the measurement reports of the accredited measuring body. For the combined heat and power plant, the measured maximum value of the four modules is provided. For the boiler plant, the measured maximum value of both boilers is provided. The officially required measurement interval is three years. The last measurement date for the combined heat and power plant was in 2019. Due to the weather, the measurement date for the boiler plant was postponed until 2020. The most recent measurement date for surface cleaning in the Graduation Production department was in 2019.

Environmental impact

Material usage



The scales and scanning units of sealed linear encoders from HEIDENHAIN are protected from chips, swarf, dirt and splash fluids by aluminum housings.

Conscientious use of materials

HEIDENHAIN has unusually high production depth. The main constituents of HEIDENHAIN products are steel, aluminum, flat glass and electronic components. The production process comprises metal machining, glass processing, graduation production, electronics production and final assembly. The following essential raw materials, auxiliary materials and supplies are used:

Steel and aluminum

Steel and aluminum are required primarily in the production of extrusions for linear encoders and of flanges for rotary and angle encoders.

Flat glass

Flat glass is primarily required as a carrier for precision graduations.

Solvents

Solvents are chiefly used for cleaning the surfaces of semi-finished and finished products.

Raw material procurement

Raw materials
in metric tons

	2018	2019	2020	2021
Aluminum	1,451	828	984	1,842
Steel	726	514	405	1,093
Flat glass	280	226	184	342

Raw materials used per kg of product
in kilograms

	2018	2019	2020	2021
Aluminum	0.29	0.22	0.36	0.45
Steel	0.15	0.14	0.15	0.26
Flat glass	0.06	0.06	0.07	0.08

The significant increase in the absolute and relative use of materials is due to the significant increase in inventory needed for ensuring sufficient supply stock.

Occupational safety and fire protection

Occupational safety

Evaluation of working conditions

For the purpose of ensuring the health and safety of all our employees, the working conditions of all employees, including any associated exposure to hazards, are systematically evaluated on a regular basis in accordance with the German Occupational Safety and Health Act. All requirements for occupational safety, such as for plant and operational safety, are regularly examined through internal audits, and any necessary measures for improvement are taken.

Employee training and professional development

Because work accidents are usually caused by behavior-related errors, great emphasis is placed on employee training. Employees are regularly instructed by their supervisors about the dangers inherent to their duties and the measures required for effective risk prevention. Opportunities for further training on occupational safety are offered through an in-house training program and are attended based on the specific hazards that employees are exposed to.

Internal communication

The safety and environmental committee convenes regularly to promote internal communication between safety specialists, the company physician, the works council and representatives of the various technical divisions. The committee members discuss occupational safety and environmental protection issues, as well as jointly define required measures.

Fire protection

Fire protection for buildings

Fire protection for buildings is taken into account particularly when new buildings are planned or when existing buildings undergo significant alteration. Building measures and fire protection systems such as fire alarm systems, fire extinguishing systems and smoke and heat removal systems are defined in a separate fire protection certificate for the new property.

Technological fire protection measures

In order to ensure rapid and precise alerting in the event of a fire, a centralized fire alarm system is in place. When a fire alarm is triggered, an internal initial response group and the Plant Security team are notified by pager. Automatic fire extinguishing systems, wall hydrants and a sufficient number of portable fire extinguishers are available within company facilities. For the general availability of extinguishing water, an adequate network of hydrants is present on the company grounds.

Fire protection at the organizational level

To improve corporate fire protection at the organizational level, employees receive basic and advanced training to become fire protection assistants. These employees must use a fire extinguisher in the event of a fire and support managerial staff, particularly the fire prevention officers, in the area of fire prevention measures.

To ensure supplier reliability for the company, the fire protection systems of suppliers are evaluated as part of supplier audits.



HEIDENHAIN Plant Security monitors safety on the company grounds and coordinates measures for the elimination of plant disturbances, such as fire alarms.

Environmental protection program for 2022

Environmental protection goals

For the efficient implementation of the environmental policy defined for our company, environmental goals with specific environmental programs are developed and updated. This process is continually influenced by the results and experience gained from the annual environmental audit.

Environmental programs include measures in all areas of corporate environmental

protection and are aimed at the reduction of our environmental impact as part of a continuous improvement process.

The release of the environmental program requires prior approval by the Management Board. Environmental programs must be compatible with the corporate environmental policy. In this context as well, the use of the technologically best processes and

methods is meant to ensure the continuous improvement of environmental protection at HEIDENHAIN.

The environmental programs comply with all legal regulations and are intended to surpass them insofar as this is economically reasonable.

Objective	Planned measures	Time frame
Climate protection	Increase in the share of renewable energy sources	2023
	The electricity from renewable resources (green power) supplied to the main campus in Traunreut in 2021 is to be extended to the German Group companies. Through the supplementation of the electricity supply via Power Purchase Agreements (PPA), approximately two-thirds of the Group's power needs will be obtained solely from renewable energies directly from the producer starting in 2024, including water power, wind power, photovoltaic power, or biogas. This solution allows the exact source of the power to be known and ensures regional sourcing.	2023
	As with power, the consumption of natural gas at the main campus in Traunreut and the German manufacturing subsidiaries will become climate-neutral. Through changes to the supply contracts, only CO ₂ -compensated natural gas is to be sourced. This voluntary compensation is achieved via certified emission-reduction credits by which an equivalent amount of emissions is compensated for in the form of climate-protection projects.	2023
	Through installation of a photovoltaic system on the roof of an operations building, approximately 400 MWh of electrical energy can be generated per year for climate-friendly self-supply.	2022
	In order to promote the e-mobility of employees, and thereby a sustainable and climate-friendly traffic system, 20 charging stations are to be set up for electric vehicles.	2022
Energy efficiency	Increased energy efficiency for building services technology	2022
	Continuing to transition the lighting systems of various operations building to LED technology is expected to save around 500 MWh of electricity annually.	2022
	Through additional measures for improving the energy efficiency of building services technology, such as the optimization of the compressed air system for an operations building, as well as the replacement of vacuum pumps, more than 200 MWh of electrical energy are to be saved per year.	2022
Environmental protection	Reduction in emissions of organic solvents	2022 to 2024
	Due to various changes in the manufacturing processes during the production of precision graduations, the specific consumption of organic solvents was lowered by 25%, which is connected to a significant reduction in VOC emissions.	
	Waste reduction	2022
	A food takeaway option was introduced for the company cafeteria in 2020. Disposable bioplastic meal boxes are used for this. The menu boxes are to be replaced with washable reusable containers. Relative to the amount from 2021, it will be possible to save approximately 100 000 disposable menu boxes.	

Results from the environmental program for 2021

Results from the environmental protection goals

The measures from the previous year's environmental programs have largely been implemented and have led to improvements in the environmental impact of our products and production processes.

We have thereby achieved a high standard, which serves as the basis for our future efforts toward ever more environmentally friendly products and production processes.

The results from the previous year's environmental program highlight our efforts to sustain a continuous improvement process for the environmental impact of the Traunreut site.

The qualitative and quantitative improvements made to our environmental impact are stated in the environmental data of the annual reports.

Within the context of the performance review and the effectiveness of the environmental goals, the quantified and scheduled environmental programs are also examined on an annual basis in consultation with the Management Board, and are redefined as needed.

Objective	Results of the implemented measures
Climate protection	Increase in the share of renewable energy sources
	As a key contribution to climate protection, power for the main campus in Traunreut has come from renewable energy sources since 2021 (green power). As a result, CO ₂ equivalents were saved by over 70% relative to the sum of direct emissions (Scope 1) and indirect emissions from energy generation (Scope 2) in accordance with the GHG Protocol.
Energy efficiency	Increased energy efficiency for building services technology
	Transitioning the lighting systems of an operations building to LED technology saves approximately 500 MWh of electricity annually.
	In order to ensure active fire prevention in a fully automated high bay warehouse, the stored goods are protected through the release of nitrogen in a reduced-oxygen atmosphere. Through renovation of the nitrogen-production system, around 30 MWh of electricity are expected to be saved annually.
	The renovation of various air conditioner units in an operations building, with a planned savings of over 25 MWh of electrical energy per year, had to be postponed to the following year (2022) due to material supply shortages.
	Through the replacement of air compressors for an operations building, approximately 20 MWh of electricity has been saved per year.
Environmental protection	Increase in the share of recycled packaging material
	For products that are sensitive to contamination and are geometrically complex, packaging is required that ensures high protection during transport of the sensitive goods. For this purpose, individual protection elements produced in a thermoforming process have been used. The plastics required for making this kind of packaging were switched from entirely new materials to the highest possible proportion of recycled materials. Due to the switch, more than 20 t per year were substituted with recycled material, which is approximately equivalent to 20% of the entire plastic packaging consumption. Due to this optimization initiative for packaging materials, more than 1.5 t of plastic packaging were also replaced by corrugated cardboard.

Statement by the environmental auditor

The signing party, Dipl.-Ing. Ulrich Wegner, EMAS environmental auditor from **TÜV SÜD Umweltgutachter GmbH**, with registration number DE-V-0045, accredited for group 26.5 (NACE code), hereby confirms that he has evaluated whether the company site stated in the updated Environmental Declaration of the organization

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83301 Traunreut, Germany,

including the Hochreit facility (Fraunhoferstr. 1) with registration number D-155-00010, fulfills all of the requirements of Regulation (EC) No 1221/2009 of the European Parliament, and of the Council, of 25 November 2009, regarding the voluntary participation by organizations in an EC system for eco-management and auditing (EMAS), updated by Regulations (EU) 2017/1505 and (EU) 2018/2026.

With the signing of this Declaration, it is hereby confirmed that

- the expert assessment and validation were conducted in accordance with the requirements of Regulation (EC) No 1221/2009, updated by Regulations (EU) 2017/1505 and (EU) 2018/2026,
- the result of the expert assessment and validation confirms that there is no evidence of any non-compliance with the applicable environmental regulations,
- and that the data and information contained in the updated Environmental Declaration for the company location provide a reliable, plausible and truthful portrayal of all activities at the location in the area stated within the Declaration.

This Declaration is not equivalent to an EMAS registration. EMAS registration may be conducted only by a competent authority in accordance with Regulation (EC) No 1221/2009, updated by Regulation (EU) 2017/1505. This Declaration must not be used as the sole basis for informing the public.

The submission of an updated environmental declaration is planned for 2023.

Munich, 4/12/2022



Ulrich Wegner
Environmental Verifier

HEIDENHAIN

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