

# HEIDENHAIN

## Environmental Declaration 2023



Sustainability for a strong future

# Flexibility in turbulent times: Pursuing sustainability and staying economically successful

Dear Reader,

2022 was a challenging year in many ways. The lockdowns in China, the supply chain crisis and the imposed sanctions due to the war in Europe, along with the related energy supply risks, resulted in significant challenges. Nevertheless, HEIDENHAIN saw very positive business performance for the reporting year.

Last year, HEIDENHAIN employees showed that it is possible to master such a highly volatile environment through foresight, flexibility and dedication. The solutions they found even accelerated our company's pace toward a sustainable, climate-neutral future.

At its Traunreut site, for example, HEIDENHAIN is no longer dependent on natural gas. Heating for the main campus and the Hochreit site is now sourced from the Traunreut municipal utilities through the district heating network, which is largely powered by sustainable geothermal energy.

Energy-saving programs for the entire company were also launched with great success, including a significant drop in energy consumption in the production departments.

New projects are passing further milestones on the path toward a sustainable future in the manufacturing and administration departments at HEIDENHAIN. These projects include approx. 6,000 m<sup>2</sup> of solar panels installed on buildings at the Hochreit site that will deliver approx. 750 MWh of power per year starting in the spring of 2023. Also entering operation are 20 charging stations for the electric vehicles of staff and visitors. Trash separation and trash prevention measures in our production, administration and logistics departments continue to be expanded. Meanwhile, we have been planning our new development center with sustainability in mind, based on the EG 40 building code.

HEIDENHAIN also wishes to expand the reach of sustainability beyond its own walls. Our products make it possible for our customers to have a smaller environmental impact with their machines. The latest generation of LC and RCN encoders, for example, have up to a 99% smaller CO<sub>2</sub> footprint. Their enhanced optics eliminate the need for energy-intensive sealing air. Other solutions, by offering intelligent process monitoring, enable a prolonged product life cycle for the machines that use them. Meanwhile, our sensors, touch probes and vision systems increase productive time through time-saving, in-process measurement, thereby promoting energy efficiency. And the long-term availability of HEIDENHAIN replacement parts allows customers to use their machines longer.

Traunreut, 3/23/2023

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 & Audit Scheme (EMAS) since August 21, 1996.



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

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### HEIDENHAIN: profile, products and sustainability

“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 factories of tomorrow.

For these applications, HEIDENHAIN develops and produces:

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


By continuously improving the accuracy, dynamic performance and process reliability of its products, HEIDENHAIN directly enhances the performance and efficiency of the machines, systems and processes used in these industries. This also makes companies more environmentally friendly by, among other things, significantly reducing their production scrap and compressed air needs.


The improved scanning optics of the next-generation LC and RCN encoders, for example, eliminate the need for compressed air in machine tools. This reduces the CO<sub>2</sub> footprint of the encoder by up to 99% throughout its service life.


Another benefit is the sustainability of HEIDENHAIN products themselves, which, unlike wear parts, are designed for the entire life cycle of a machine. And our servicing approach has long prioritized repairs and very prolonged servicing intervals. Meanwhile, the high proportion of reusable materials in our products also ensures a high recycling rate at the end of their service life.

### HEIDENHAIN worldwide

 **8,700** employees

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

 Over **27.2 million** rotary encoders and angle encoders

 Over **8.4 million** linear encoders

 Over **516,000** digital readouts

 Over **320,000** controls

### HEIDENHAIN controls

HEIDENHAIN controls have a 35-year proven track record of daily use on milling machines, lathes, drilling machines and machining centers. From everyday 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 standardized user interface, operators can readily switch between different HEIDENHAIN controls. The high-performance functionality of these controls ensures optimum motion control for

greater accuracy, higher removal rates and more reliable processes. Process monitoring and component monitoring functions, for example, reliably protect the machine tool from damage and excessive loading, thereby significantly contributing to longer machine life cycles.

The functions of HEIDENHAIN controls also provide users with numerous ways to sustainably reduce their carbon footprint. Fast setup and a high degree of automation reduce non-productive times. Functions that increase machining efficiency optimize the output and reduce the amount of energy consumed per finished part. Complete machining capabilities shorten process chains.

### 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:

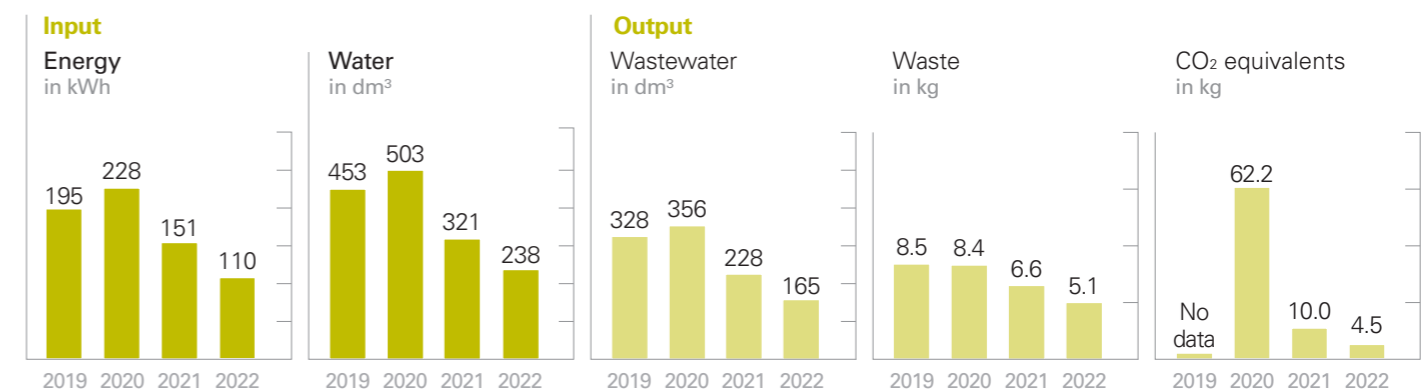
- Production of microstructures, particularly on glass or glass ceramics
- Optical, inductive and magnetic scanning principles
- Downstream processing of measured data in integrated electronics



### 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 thousand EUR of gross value added)



The specific input-output balance was considerably improved.

## 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 semiconductors, electronics or mechanical engineering.


### The campus in numbers

- 

Total area  
**307,000 m<sup>2</sup>**
- 

Approx. **71%** surfaced  
Approx. **17%** natural  
Approx. **12%** semi-natural
- 

**4,150** employees
- 

**EUR 638 million**  
Gross value added in 2022
- 

**4,882 t** overall output 2022  
(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:

- Generation of electricity and heat in the gas-powered combined heat and power plant with centralized furnaces for peak usage and emergency redundancy
- 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. Gross value added now serves as a new reference metric. This metric was applied retrospectively for the period from 2019 to 2022.

### Hochreit campus

The HEIDENHAIN headquarters was originally concentrated on its campus in the middle of Traunreut. Today, it is supported 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.

	2019	2020	2021	2022
Energy consumption in GWh	11.6	11.7	13.0	12.1
CO <sub>2</sub> emissions in metric tons	850	830	810	540
Fresh water consumption in m <sup>3</sup>	32,000	28,000	27,000	24,000

The efficiency of the Hochreit site was improved in 2022 thanks to the significant increase in production volumes.



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 the following labor and environmental 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 the protection of 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 endeavors 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 of 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.

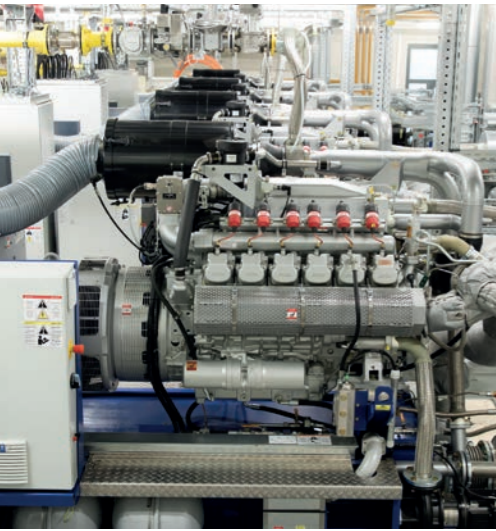
The environmental audit therefore ensures that the current environmental management system complies with the company's environmental policy.

Process landscape with essential process descriptions of the environmental management system



# Environmental impact

## Energy



The gas-powered combined heat and power plant will be used only for peak demand in winter or as a backup in the event of an emergency.

Due to the natural gas shortage and the resulting lack of reliable supply, and due to sustainability reasons, HEIDENHAIN changed its heating strategy in 2022. We now rely primarily on climate-friendly district heating. In the future, more self-produced, renewable electrical energy will be used at this site.

### Heating

The company's heating needs are primarily covered by district heating from the Traunreut municipal utilities. This district heating is generated mainly from renewable energy sources, primarily geothermal energy and biomass.

The company's own gas-powered combined heat and power plant, as well as the already existing heating systems, will be operated only for peak demand in winter or as a backup in the event of an emergency. The already existing heating systems can be operated on either natural gas or heating oil depending on the supply situation.

### Electricity

Our electrical energy needs, which must also compensate for the significantly reduced operation of the combined heat and power plant, are covered entirely by green electricity obtained from renewable, environmentally friendly sources. However, we do not wish to rely solely on green-energy certifications, which is why, in the future, our site will generate more climate-friendly electricity on its own.

### Renewable energy

Of our entire energy consumption of 70.3 GWh in 2022, approximately 54.5 GWh came from renewable sources. The proportion of renewable energy was therefore approximately 77% across all sources used.

### 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 for 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

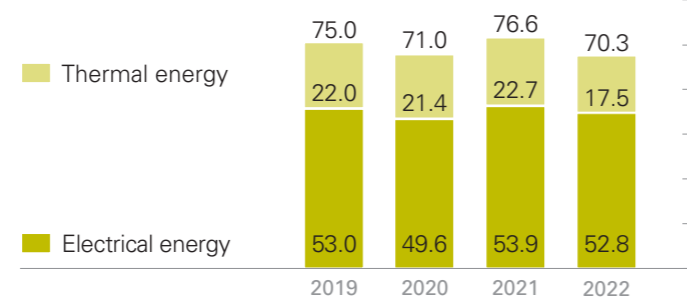
An extensive energy monitoring system that transparently tracks the energy consumption of all buildings is continually under expansion. Through continuous monitoring of the consumption rates, negative trends are easier to monitor and specific weaknesses can be identified. The energy monitoring system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



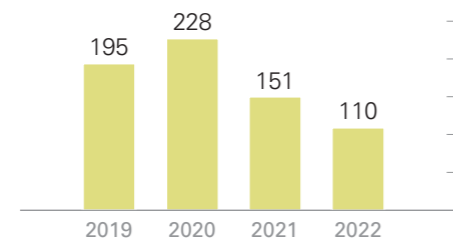
HEIDENHAIN glass scales, which feature accuracies in the micrometer range, are manufactured in the Mastering department. Our precise manufacturing processes place highly stringent demands on the quality and reliability of our clean-room technology.

### Energy consumption

Overall in GWh



Per thousand EUR of gross value added in kWh



The absolute energy consumption and the specific energy consumption in 2022 were considerably reduced. The energy saving programs had a very noticeable effect.



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 CO<sub>2</sub> footprint of their systems.



# Environmental impact

## Water and soil



### Fresh water

Approx. 152,000 m<sup>3</sup> of fresh water was used in 2022. This fresh water is primarily needed for climate control in production and assembly departments, and for cleaning processes during the manufacture of graduations. Our fresh water is sourced entirely from the public mains of the Traunreut waterworks.

### Wastewater

#### Water types and quantities

Approximately 105,000 m<sup>3</sup> of production wastewater and sanitary sewage were produced in 2022. 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.

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

### 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. They treat and monitor the pH of minimally contaminated rinse water from the production of graduations.

### Reintroduction into the water cycle

For many years, rainwater from new buildings has been 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.

The processing of glass and glass ceramics produces waste water. Releasing this waste water into the public sewage system requires permission 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.

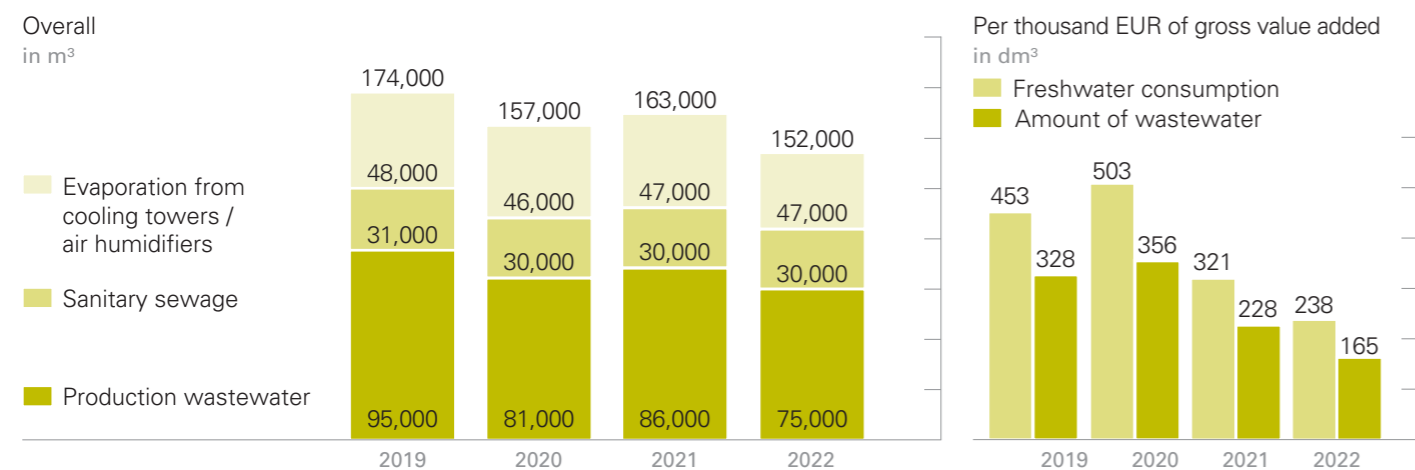
### Soil protection

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.



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

### Freshwater consumption / wastewater



The absolute water usage and the specific water usage were considerably reduced in 2022.

### Legal and government agency wastewater limits and measurement results

	Unit	Limit value	Measurement results
<b>Graduation production (E90 and A40)</b>			
Hydrocarbons	mg/l	20	< 19
Zinc	mg/l	5	< 0.05
Chromium	mg/l	1	< 0.01
Nickel	mg/l	1	< 0.01
AOX	mg/l	1	< 0.1
<b>Glass processing (E92 and H14)</b>			
Copper	mg/l	0.3	< 0.16
Lead	mg/l	0.3	< 0.03
Arsenic	mg/l	0.3	< 0.25*
Wastewater amount (E92 / H14)	m³/d	80 / 99	< 3 / < 98

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.

\* As part of our self-monitoring process, faulty samples caused the appearance of non-representative values for arsenic in 2022. These values are not included in the table, because there was no further threshold exceedance after we consulted with the government agency and corrected the error.

# 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, mainly from the electronic production department
- Household-like commercial waste
- Hazardous wastes, in particular solvent-water mixtures and cooling lubricants

### 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 strict waste separation, approx. 3,137 metric tons, or 95% of our waste, was sent to recycling in 2022. Most of the waste is disposed of by regional waste management companies. Hazardous waste is primarily disposed of by GSB Sonderabfall-Entsorgung Bayern.

### Measures for waste reduction in production departments

#### 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 produced are first chopped up by a shredding unit, and adherent emulsifiers are then removed in a centrifuge. This makes it possible to more effectively and economically recycle the metal chips with a moisture content of less than 1%. 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:

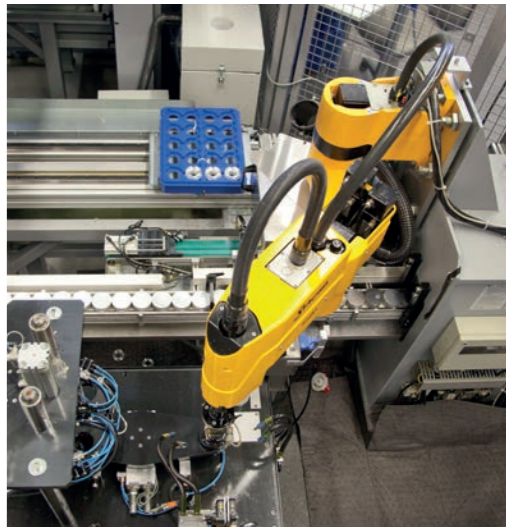
- A solvent-water mixture for the surface cleaning of semi-finished and finished products
- Waste from coating processes, adhesive residue from assembly processes and soiled cellulose cloths from cleaning activities
- Diverse waste containing acids and bases from graduation production

### 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.



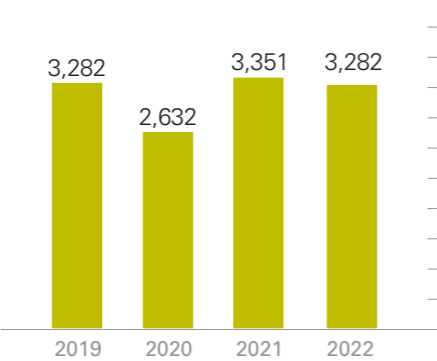
Many components of HEIDENHAIN encoders are manufactured in automated production systems. In order to increase service life and reduce waste, the cooling lubricants needed for metal cutting are constantly monitored.

### Waste statistics

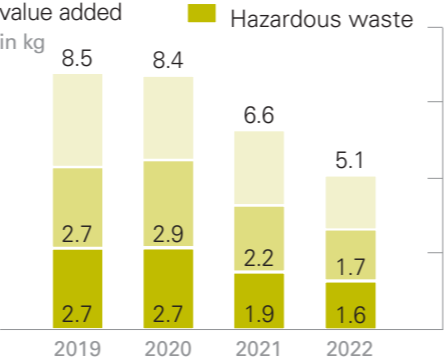
Waste and recyclables in metric tons

	2019	2020	2021	2022
Electronics	115	88	97	100
Glass	63	46	63	52
Commercial waste	247	213	284	243
Wood	194	116	148	154
Metal	1,035	898	1,142	1,075
Paper	244	191	246	255
Hazardous waste	1,021	832	985	1,016
Other waste	363	248	386	387

Overall in metric tons



Per thousand EUR of gross value added in kg



Both the absolute and specific amount of produced waste was reduced.



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.



# Environmental impact

## Emissions



HEIDENHAIN precision graduations have line widths ranging from 0.25 µm to 10 µm. Manufacturing these graduations (e.g., DIADUR or METALLUR) requires special capital investments in buildings, climate control and process technology.

### Environmentally relevant emissions

Environmentally relevant direct atmospheric emissions at our site are primarily caused by the following factors:

- Gas and coal firing of the combined heat and power plant and of the peak-demand and emergency backup heating systems
- Chemical surface treatment of components and devices, such as for coating and cleaning processes

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

### Greenhouse gas emissions

The CO<sub>2</sub> equivalent takes into account the anthropogenic greenhouse gases from Scope 1 emissions sources (direct release of climate-damaging gases at the company) and Scope 2 sources (indirect release of climate-damaging gases by energy providers).

Due to the site restructuring of our heating sources toward predominantly renewable district heating, Scope 1 greenhouse gas emissions arising from the combined heat and power plant for peak demand and

emergency backup heating now play a subordinate role.

Our Scope 2 greenhouse gas emissions arising from purchased energy have been climate-neutral since 2021. This was achieved through the switch to climate-friendly green electricity and district heating.

We have now also begun tracking our Scope 3 greenhouse gas emissions from activities up and down the value chain. In order to continue reducing our greenhouse gas emissions, we plan to take further measures within Scope 3 in upcoming years so as to reduce our climate-damaging emissions.

### Systems requiring approval

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 continually being taken in order to maintain the state of the art in minimizing emissions.

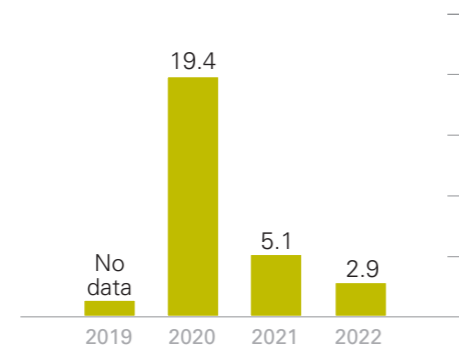
A reduction in the use of volatile organic solvents is another long-term goal of the company. The approval of more environmentally friendly replacement substances for surface cleaning is continuously being pursued, although the very high quality requirements of individual cleaning processes must be considered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



Solvents are chiefly used for cleaning the surfaces of semi-finished and finished products. Approximately half of our used solvents are recycled; the remainder are released into the surrounding air in the form of emissions.

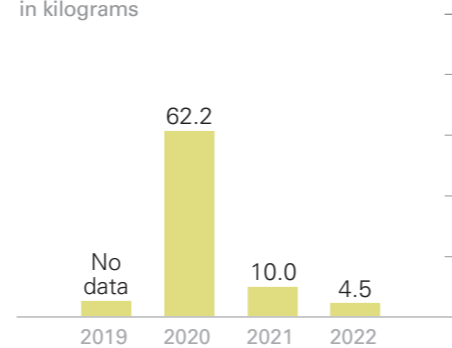
### Emissions

CO<sub>2</sub> equivalent in metric tons

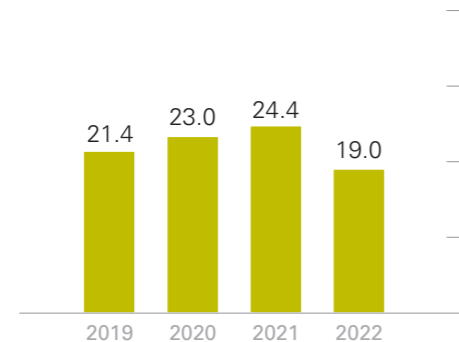


Our switch to renewable district heating in mid-2022 caused a significant reduction in CO<sub>2</sub> equivalents. The unusually large reduction in CO<sub>2</sub> equivalents in 2021 was due to our switch to climate-friendly green electricity. A greenhouse gas balance sheet was not created in 2019.

CO<sub>2</sub> equivalent per thousand EUR of gross value added in kilograms

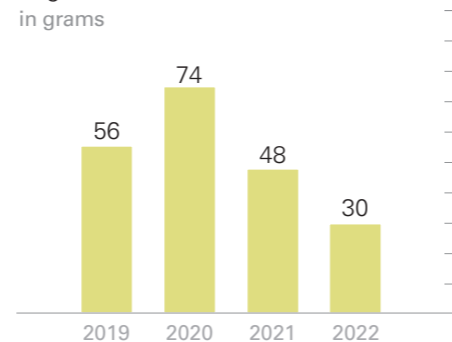


Volatile organic compounds (VOC) in metric tons



Both the absolute and specific VOC emissions were significantly reduced. Reports from previous years have been revised to account for updated emissions factors.

VOC emissions per thousand EUR of gross value added in grams



### Legal and government agency emission limits and measurement results

	Unit	Limit value	Measurement results
<b>Combined heat and power plant, Modules 1 to 4</b>			
Carbon monoxide	mg/m <sup>3</sup> NC	300	< 20
Nitrous oxide	mg/m <sup>3</sup> NC	250	< 240
Formaldehyde	mg/m <sup>3</sup> NC	20	< 5
Sulphur oxides	mg/m <sup>3</sup> NC	10	< 1
<b>Boiler plant Boilers 1 and 2</b>			
Nitrous oxide	mg/m <sup>3</sup> NC	150	< 56
Emissions loss	% NC	9	< 7
<b>Graduations production</b>			
Total carbon A40 exhaust air system	mgC/m <sup>3</sup> NC	75	35
Total carbon E90 exhaust air system	mgC/m <sup>3</sup> NC	75	15
Total carbon E92 exhaust air system	mgC/m <sup>3</sup> NC	75	47

The results (in mg/m<sup>3</sup> NC = mg/m<sup>3</sup> 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 stated. For the boiler plant, the measured maximum value of both boilers is stated. The officially required measurement interval is three years. The most recent measurement date for the combined heat and power plant was in 2022. The most recent measurement date for surface cleaning in the Graduation Production department was also in 2022.

# 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 operating materials 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.

## Production material procurement

Raw materials in metric tons

	2019	2020	2021	2022
Aluminum	828	984	1,842	1,580
Steel	514	405	1,093	710
Flat glass	226	184	342	291

Raw materials used per thousand EUR of gross value added in kilograms

	2019	2020	2021	2022
Aluminum	2.2	3.2	3.6	2.5
Steel	1.3	1.3	2.2	1.1
Flat glass	0.6	0.6	0.7	0.5

The significant increase in the absolute and relative use of production materials in 2021 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 reviewed 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 especially 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. It is their task on the one hand to operate a fire extinguisher in case of fire, and on the other to support supervisors and in particular the fire safety engineers in the area of preventive fire protection.

To ensure supply security for the company, the suppliers' fire protection measures also are evaluated during supplier audits.



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

## 2023 environmental plan

### Environmental objectives

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 plans include measures in all areas of environmental protection at HEIDENHAIN, which are aimed at the reduction of our environmental impact as part of a continuous improvement process.

Approval of the environmental plan requires the prior approval of the Management Board. It must be possible to integrate the environmental programs into the company's

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	2024
	The green electricity that has been delivered since 2021 for the Traunreut main office has been expanded to the German Corporate Group since the beginning of 2023. Through the supplementation of the electricity supply via Power Purchase Agreements (PPA), approximately 40% of our electricity needs will be obtained solely from renewable energy sources directly from the producer starting in 2024, including water power, wind power, solar power or biogas. This allows the exact source of the power to be known and ensures regional sourcing.	2024
	As with electricity, 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 <sub>2</sub> -compensated natural gas is to be sourced. This voluntary compensation is achieved via certified emission-reduction credits by which the amount of emissions is compensated for in the form of climate-protection projects.	2023
Promoting the use of electric vehicles	Through the installation of solar panels on the roofs of two corporate buildings, approximately 750 MWh of electrical energy can be generated per year for climate-friendly self-supply.	2023
	We plan to gradually switch all factory traffic to electric vehicles. The first step is to replace five vehicles using conventional combustion engines with electric vehicles.	2023 to 2024
	In order to promote electric mobility, 20 charging stations will be set up for electric vehicles. In addition, staff will be provided with charging stations for electric bikes.	2023
Energy efficiency	Increased energy efficiency for building services technology	2023 to 2024
	The continued process of changing the lighting systems of various corporate buildings to LED technology is expected to save around 600 MWh of electricity annually.	2023
Environmental protection	To increase the energy efficiency of our building service facilities, the compressed air piping systems will be optimized, saving approx. 170 MWh of electricity. And process optimization of compressed air in the metalworking department is expected save approx. 600 MWh of electricity annually in 2023.	2023
	Reduction in the emission of organic solvents	2022 to 2024
	Reduction in waste production	2023
	Due to various changes in manufacturing processes for precision graduations, the specific consumption of organic solvents is to be reduced by 25% relative to 2021, which is tied to a significant reduction in VOC emissions.	
	Due to tailored optimization of the waste separation system in our offices, the paper recycling rate is to be increased.	

## Results from the 2022 environmental plan

### Status of environmental goals

The measures from the previous year's environmental plan 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 plan 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.

As part of evaluating the success and effectiveness of the environmental goals, the quantities and deadlines of the environmental plans are annually reviewed in coordination with the Management Board and, if necessary, are redefined.

Objective	Results of the implemented measures
Climate protection	Increase in the share of renewable energy sources
	To contribute to our own energy production, we began installing solar panels on the roof of a corporate building. These panels are expected to deliver 400 MWh of electricity per year. Due to material shortages, operation of the panels has been delayed to 2023.
	In order to promote the use of electric vehicles by employees, we have begun setting up 20 charging stations for electric vehicles. Due to material shortages, operation of the charging stations has been delayed to 2023.
Energy efficiency	Increased energy efficiency for building services technology
	Our switch to LED technology for the lighting in various corporate buildings was continued. Capacity and material shortages caused delays in implementation.
	In order to increase the energy efficiency of building services facilities, various vacuum pumps were replaced, saving more than 50 MWh of electrical energy per year. Plans to optimize the compressed air systems have been postponed to 2023 due to material shortages.
Environmental protection	Reduction in the emission of organic solvents
	Due to various changes in the production processes for precision graduations, the specific consumption of organic solvents is expected to be reduced by 25% within three years, which will be associated with a significant reduction in VOC emissions. Thanks to the implementation of various process optimization measures, the specific consumption of organic solvents was reduced by approx. 20% in 2022.
	Reduction in waste production
	A carry-out food option was introduced for the company cafeteria in 2020. In the past, disposable food containers were used for this. They have now been replaced with washable, reusable containers. Compared with 2021, we saved approximately 100,000 disposable food containers in 2022.

# Statement by the environmental auditor

The signing party, Dipl.-Ing. Wolfgang Brandl, EMAS environmental auditor from **TÜV SÜD Landesgesellschaft Österreich GmbH**, with registration number ATFV-0003, 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

DR. JOHANNES HEIDENHAIN GmbH  
Dr.-Johannes-Heidenhain-Str. 5  
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.

Munich, 4/13/2023



Wolfgang Brandl  
Environmental Auditor

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 2024.

# GRI content index

## End-user declaration

DR. JOHANNES HEIDENHAIN GmbH has reported the information stated in this GRI content index for the period of January 1, 2022, to December 31, 2022, with reference to the GRI standards. This reporting used the GRI 1: Foundation 2021 standards.

GRI standards		Pages	Sustainable development Goals
<b>GRI 2: General Disclosures 2021</b>	2-1 Organizational Details	6, 7	
	2-3 Reporting period, frequency and contact point	22, 23	
	2-5 External assurance	9, 22	
	2-6 Activities, value chain and other business relationships	4, 5	
	2-22 Statement on sustainable development strategy	2	
	2-23 Policy commitments	8, 9	
<b>GRI 301: Materials 2016</b>	301-1 Materials used by weight or volume	18	
<b>GRI 302: Energy 2016</b>	302-1 Energy consumption within the organization	10	
	302-3 Energy intensity	10	
	302-4 Reduction of energy consumption	11, 21	
<b>GRI 303: Water and effluents 2018</b>	303-1 Interactions with water as a shared resource	12	
	303-2 Management of water discharge-related impacts	13	
	303-3 Water withdrawal	12	
	303-4 Water discharge	12	
	303-5 Water consumption	12	
<b>GRI 305: Emissions 2016</b>	305-1 Direct (Scope 1) GHG emissions	16	
	305-2 Energy indirect (Scope 2) GHG emissions	16	
	305-4 GHG emissions intensity	16	
	305-7 Nitrogen oxides (NOx), sulfur oxides (SOx) and other significant air emissions	17	
<b>GRI 306: Waste 2020</b>	306-1 Waste generation and significant waste-related impacts	14	
	306-2 Management of significant waste-related impacts	15	
	306-3 Waste generated	14	
<b>GRI 403: Occupational health and safety 2018</b>	403-1 Occupational health and safety management system	19	
	403-2 Hazard identification, risk assessment, and incident investigation	19	
		403-5 Worker training on occupational health and safety	19

# HEIDENHAIN

Mastering nanometer accuracy

## HEIDENHAIN

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