

Sustainability at ZEISS

How innovative solutions help to make
the future more sustainable



Seeing beyond

Table of Contents

Foreword	3	Future-Focused	27
Moving Toward a Sustainable Future	4	Digital, yet Personal	28
		Sustainability at a Micro Level	30
		On the Road to ... Circularity	32
Promising Prospects	6		
Can Water Be Recycled? Yes, It Can.	7		
3-D Printing: a Partnership for More Sustainability	8	Outlook	34
A Sharp Focus on Biodiversity	9	Imprint	35
Hope for the Fight Against Breast Cancer	11		
Innovative Insights	13		
Making Microchips More Sustainable	14		
Taking Retro to the Future: ZEISS PerformanceFit	18		
The Future? Think in Circles!	21		
Lasting Success Through Community	24		

ZEISS Products for the Future



Hope 11
for the Fight Against Breast Cancer



Taking Retro to the Future: 18
ZEISS PerformanceFit



Sustainability 30
at a Micro Level

Foreword

Dear Readers,

We see the world as it really is, right?

Actually, sometimes things that used to seem clear suddenly get a bit fuzzy. And vice versa. The world changes with every day that passes.

At ZEISS, we take this challenge as motivation. We enjoy learning new things, and we are always reassessing our current situation as well as our potential future one. That's how we come up with new and more sustainable ways of doing things.

Sustainability takes many forms at ZEISS. To give you a better idea of what those are, we'd like to introduce you to the various examples of our forward-thinking innovation and, more importantly, the fantastic people behind them. We invite you join us on a journey into the future and experience the change with us.

At ZEISS, we collaborate with our customers and partners to find new approaches and solutions for a livable future, both in our core business and as part of our involvement in issues of sustainability. We take visions and develop them into innovative products and services that make a positive contribution to the environment and society.

Our goal is to integrate sustainability into our core business, and we have already made significant progress on that. In developing our strategy, we have prioritized three main issues: climate protection, circular economy, and added value for society. In addition to implementing production that consumes resources efficiently and

striving to achieve carbon neutrality, we are working toward making our organization circular. "Circular economy" is more than just trendy industry jargon. The circular economy is a blueprint for the present and future of our business and our world. The third pillar of our work addresses our goal of adding value for society. As a company that is ultimately owned by a foundation, we seek not only to contribute to society with our products, but also to foster education and research so that we can enable an innovative and more sustainable future for generations to come.

Putting these goals in focus, we are optimistic about the future and are laying the path toward it right here, right now, with the people who work with us on solutions for the future by using all their creativity, passion, and expertise. We are proud of everything we have achieved so far, though we also know that we still have a long journey ahead of us.

So, please join us on this journey to a future we want to see!



Nicole Ziegler





Moving Toward a **Sustainable Future**

The destination is clear: a sustainable future. It is an ambitious goal and it may well seem overwhelming at first glance. ZEISS has done pioneering work for over 175 years, which is also why it sets its sights high when it comes to solutions for matters related to sustainability. ZEISS has defined targets that will spur the company's contribution to an economic transformation that prioritizes sustainability, and it has already achieved a great deal on this journey.

Sustainability Is Part of the Company Strategy

Sustainability is firmly established within ZEISS because the future – and ZEISS as a company – won't exist without sustainable solutions. ZEISS wants to play an active role in bringing about a viable world by taking responsible actions. It seeks to strengthen positive development and innovation. We see sustainability as an opportunity. An opportunity for long-term commercial success, for society, and for the environment.

Focus Issues Determine the Direction

With the Group-wide Sustainability Program that we created in 2020, we're undertaking far-reaching work in pursuit of our goals and strategic focus issues: climate protection, circular economy, and added value for society. They guide our actions, the way we work together, and how we see ourselves.

Our Strategic Focus Issues and Targets for 2025



Climate Protection:

ZEISS aims to achieve carbon neutrality in its organization's emissions (scopes 1 and 2) by 2025. In addition, ZEISS is addressing the emissions that are produced by its upstream value chains. Moreover, it aims to use energy as efficiently as possible.



Circular Economy:

ZEISS strives for circular resource usage that reduces the impact on the environment. To achieve this, it plans to use more renewable and recycled materials and turn linear material flows into closed loops. It intends to lower water consumption and waste even further.



Added Value for Society:

ZEISS wants to add value for society with its products. This added value includes giving as many people as possible access to high-quality healthcare.

-20%

energy consumption reduction

(relative to value added) on FY 2018/19

-10%

waste reduction

(relative to value added) on FY 2018/19

-15%

water consumption reduction

(relative to value added) on FY 2018/19

The ZEISS Journey toward a More Sustainable Future

The targets that we have set are highly varied, and the ideas for achieving them are just as diverse. In collaboration with its partners, ZEISS is applying a focused approach and committing itself to a sustainable future. Numerous projects have already been completed under the Sustainability Program in order to achieve the targets. For instance, the electricity supplied to ZEISS sites all around the world in the 2021/22 fiscal year was almost fully from green sources. Simultaneously, their capabilities for self-supplying sustainable energy were also expanded. Another key challenge that ZEISS is addressing is optimizing the sustainability of its supply chain. This saw ZEISS analyzing the emissions of its upstream value chain (scope 3) for the first time, a necessary measure in order to take the next step of reducing them systematically. Success here hinges on being part of a strong network, which is why ZEISS works in close partnership with its suppliers, customers, and internal and external experts.

ZEISS high-tech offices in Jena



Promising Prospects

The public debate about sustainability is often dominated by bad news. It overshadows the good news, even though the good news is what inspires people because it highlights innovations and opportunities. And there are always innovations and opportunities out there. This chapter provides an insight into four promising ZEISS projects that are all driving sustainable development.

Can Water Be Recycled? **Yes, It Can.**

PROMISING PROSPECTS

Climate change affects us all, especially in the regions of the world where it is causing water shortages. For this reason, ZEISS is constantly on the lookout for possibilities to use water more efficiently and protect the environment.

Water is a resource that is in increasingly short supply, particularly in arid regions that have a very dry climate. Such regions include parts of Mexico, India, China, and California, for example, where ZEISS Vision Care operates multiple sites. ZEISS therefore believes it is very important to use this resource carefully and reduce water consumption with innovative measures.

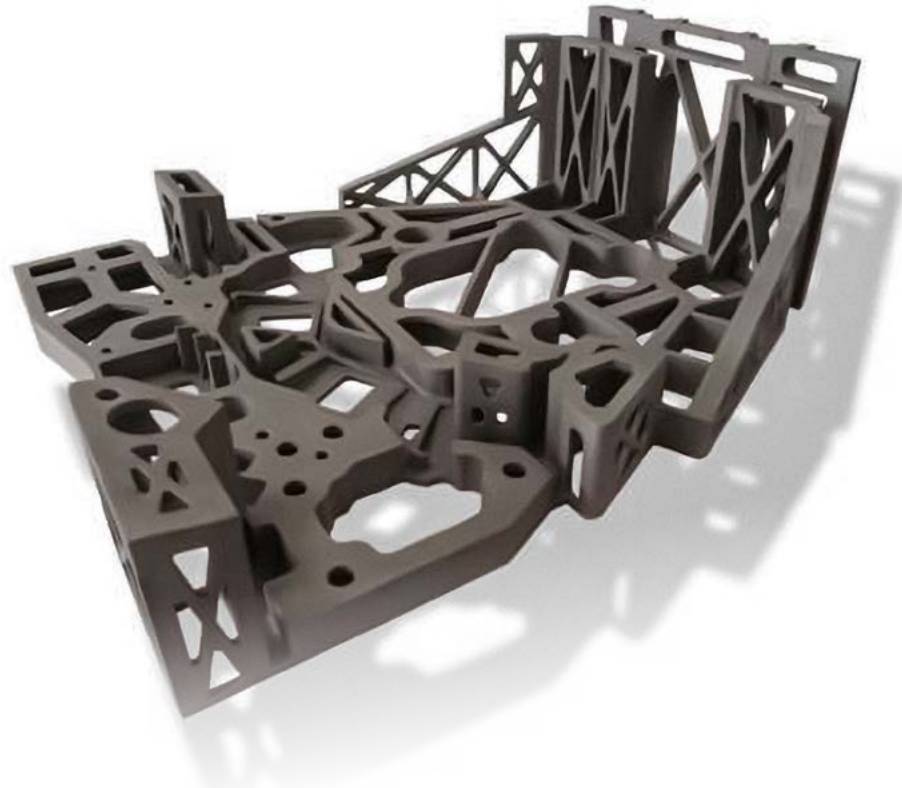
ZEISS applies metrics that provide guidance and incentives for comprehensive initiatives. For instance, it intends to reduce its water consumption in relation to value added (EBITDA minus personnel expenses) by 15 percent by the 2024/25 fiscal year.

India is a good example of the efficiency of these efforts: The ZEISS production site in Bangalore has a rainwater collection system on its roof with tanks that collect water up to a capacity of 10,000 liters during the monsoon period. This rainwater is used for production, while the water that has already been used is being treated using a water recycling system. As a result, roughly 95 percent of the water

initially used for eyeglass lens production can be reused, which made it possible to reduce water consumption by 6.8 million liters between 2019 and 2021.

ZEISS Vision Care operations in Mexico were also able to halve their freshwater consumption between 2019 and 2021 even in the face of major challenges, especially in the state of Baja California. The government frequently shut off water supply, which negatively impacted ongoing operations, the customer service, and the quality and volume of fresh water available for the local population and also led to a constant risk of wildfire.

Measures taken within the production of Mexican prescription lenses (MXRx) made the greatest contribution to the reduced water consumption. Overall freshwater consumption decreased by 94 percent between 2019 and 2023, with the most important initiatives being stopping tank flushing in production, the filtration and reuse of eyeglass lens rinse water, and the reuse of residual water from machinery in other processes.



3-D Printing: a Partnership for More Sustainability

What do you do when you cannot make progress despite the best expertise and best technology? You rethink ideas – and work with partners to adopt new methods.

The idea of using a 3-D printer to process something other than plastic industrially was a pipe dream for a long time. However, ZEISS made it a reality with its supplier Schunk Ingenieurkeramik. Schunk Ingenieurkeramik repurposed a 3-D printer in such a way that it became able to process ceramic, which is one of the hardest and most heat-resistant materials there is. As a result, it can produce components that were previously impossible with ceramic due to their complexity and size. This is perfect for ZEISS, which requires structural components that are large and ceramic. How large? “As large as an adult person,” says Stefan Unger, who is in charge of Supply Chain Sustainability at ZEISS Semiconductor Manufacturing Technology. There used to be a number of challenges with the conventional method for producing support structure components, which involved pressing silicon carbide powder into a block and subsequently milling it. A new idea was needed. “For us, ZEISS was

the ideal partner to develop 3-D printing further,” says Dr. Lars Schnetter, Managing Director of Schunk Ingenieurkeramik. Making ceramic components through 3-D printing is more flexible, cost-effective, and resource-friendly as well as less error-prone than conventional methods. “We were initially a bit skeptical if a supplier could even meet our demanding requirements with a printing process,” Stefan Unger reveals. Yet the patience and trust shown by both parties paid off in the end. Schunk Ingenieurkeramik and ZEISS have been driving technological innovation together since as far back as 2008, which means they have also been working on another issue at the same time: sustainability. “3-D printing saves not only time, material, and money, but also copious amounts of carbon dioxide,” says Stefan Unger, “This technology has major potential since it can be transferred to other fields. What’s more, this is just the start.”



50%

less powder and 40% less energy across the entire process means 50% less carbon emissions



500

tonnes less CO₂ from Schunk in 2022 (approx.)



10–20%

additional future carbon emission reduction from optimizing raw material production processes

A Sharp Focus on **Biodiversity**



© Verein Jordsand – Leonie Lange

Once lively, colorful, and varied, many ecosystems have declined in biodiversity because of human influence from climate change and tourism. ZEISS wants to build up and maintain our biodiversity, and the future does indeed seem a bit rosier when you add the right partners. Verein Jordsand, a nonprofit organization established in 1907, is one of Germany's oldest nature preservation associations. Its mission is to help migratory and breeding birds on the North and Baltic Seas by protecting these impressive animals and their habitats. ZEISS has been supporting this project by providing funding as well as optical instruments since early 2022.

>>

“Together with ZEISS, we are preserving important ecosystems and giving migratory and breeding birds crucial support. Visitors can experience these sensitive habitats thanks to ZEISS optical instruments.”

Dr. Steffen Gruber

Chief Executive Officer, Verein Jordsand



115 years

of protecting seabirds on the North and Baltic Seas

20 conservation areas

with millions of resting birds and thousands of breeding birds

2,500 members

(rounded)

“Our partnership with Verein Jordsand is a win-win: Together, we protect breathtaking natural landscapes, preserve ecosystems, raise awareness, and learn from our shared dialog.”

Johannes Fürst

Head of Marketing and Communication
ZEISS Consumer Products Europe



© Verein Jordsand – Damaris Buschhaus

**Verein Jordsand zum Schutz
der Seevögel und der Natur e. V.**
More information about the nature
preservation association





Hope for the Fight Against Breast Cancer

ZEISS uses its technology, expertise, and commitment to develop promising solutions which provide lasting help and hope. Intraoperative radiotherapy (IORT) with INTRABEAM® from ZEISS offers an alternative to conventional external beam radiotherapy in the fight against breast cancer.

Being diagnosed with breast cancer causes anxiety and stress, which tend to be exacerbated by the treatment and its side effects. These days, however, there is now a highly effective and less invasive therapy option in the form of intraoperative radiotherapy. The radiation is administered in a single, approximately 30-minute dose during the operation directly after the surgical removal of the tumor. This means that the traditional follow-up radiotherapy – which typically lasts about six weeks – can be shortened or, in the best-case scenario, even skipped altogether. Healthy adjacent tissue and skin is spared. That means the efficacy of the treatment remains the same, just with a shorter radiation duration and less radiation exposure.

The clinical study results published in August 2020 provide grounds for optimism, with one-time, targeted intraoperative radiotherapy (TARGIT) using ZEISS INTRABEAM found to be non-inferior to external beam radiotherapy (EBRT). There is similar risk of tumor recurrence in the breast; however, the non-breast-cancer mortality is reduced.¹

The TARGIT method, using INTRABEAM® from ZEISS, is the result of two decades of interdisciplinary research. The clinical endorsements for the method are motivating the Medical Technology team at ZEISS to continue working intensively on innovative technological solutions that help doctors to improve their patients' quality of life. Over 45,000 people have already been treated using the TARGIT method. More than 260 breast cancer clinics in 38 countries adopted this method by 2021.²

>>

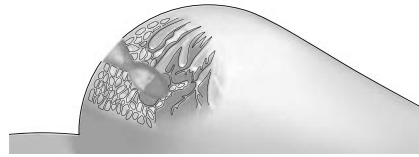
¹ <https://www.zeiss.com/meditec-ag/media-news/press-releases-hcp/2020/targit-a-breast-cancer-study.html>

² <https://www.nature.com/articles/s41416-020-01233-5>

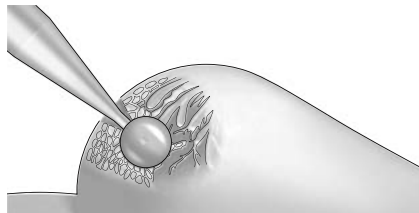
How the Method Works:



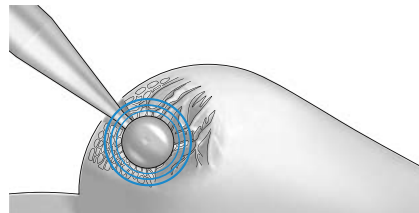
1. A minimally invasive entry point is created during surgery.



2. The tumor is surgically removed.



3. The suitable applicator diameter is determined and positioned in the tumor cavity.



4. The tumor bed is irradiated locally for approx. 30 minutes.

Not all products, services or offers are approved or offered in every market and approved labeling and instructions may vary from one country to another. For country-specific product information, see the appropriate country website. Product specifications are subject to change in design and scope of delivery as a result of ongoing technical development.

¹ <https://www.zeiss.com/meditec-ag/media-news/press-releases-hcp/2020/targit-a-breast-cancer-study.html>

² Annually, if used extensively, only for the UK; <https://pubmed.ncbi.nlm.nih.gov/27160842/>

Benefits Compared to Conventional Radiation¹

- + Equal clinical effectiveness
- + Similar local recurrence rate (tumor regrowth)
- + Considerably shorter radiation duration

Benefits for Patients¹

- + Less pain in the breast
- + Increased quality of life thanks to less radiation exposure
- + Better cosmetic results

Benefits for Sustainability

- + Further reduction of resource consumption and of clinic space needed because special rooms are unnecessary and INTRABEAM® from ZEISS is highly mobile
- + Savings from lower purchase and operating costs



1,200

carbon emissions lowered by 1,200 tonnes (equivalent to 100 hectares of forest)²



170,000

170,000 hours of lifetime saved (can be used instead for childcare, volunteer work, or paid work, for example)²



8 million

8 million fewer commuting kilometers (traveling to clinic)²

You can see here how the method works as well as find further information about INTRABEAM® from ZEISS.



Innovative Insights

The buzzwords and headlines make innovation and sustainability sound easy, when in fact they need time and space. This chapter provides exactly that and shows how ZEISS is driving sustainability. It covers four different topics that all contribute toward the overarching goal of a livable future.

Making Microchips More Sustainable

They are little components that offer space for more and more transistors, and they are becoming more high-performing. They are called microchips, and they are essential in the fight against climate change. They underpin sustainable technologies such as photovoltaic systems, wind turbines, and electric vehicles. However, manufacturing these indispensable microchips and their components requires a lot of energy. Can microchips be made more sustainable? If so, how?

A Summary of the Microchip Manufacturing Process

“The first thing to do is to decide what more sustainability actually means in connection with microchips,” explains Tobias Berndt, Sustainability Project Manager at ZEISS Semiconductor Manufacturing Technology: “An entire range of machines and processes are needed for manufacturing microchips.

Optical lithography systems have a very important role in them, and we develop and produce these systems in the ZEISS Semiconductor Manufacturing Technology segment. To make them more sustainable, we look primarily at the product development and manufacturing process for the optical systems and the infrastructure needed for it. On top of that, our products are also influenced by the attributes of the chips that they are used to make.”

Optical lithography is the key process used for manufacturing microchips. It involves a round disk consisting of silicon wafer with a photoresist coating being used as a foundation for the microchips and a pattern of an optical mask being greatly reduced in size and transferred onto the foundation using various chemical and physical processes. The electronic components and traces on the microchips are created by repeating these processes about 100 times.

>>

30%

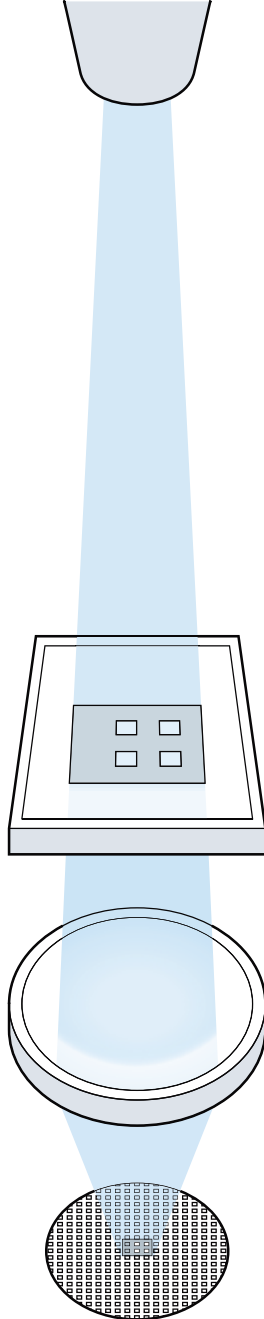
EUV chips are roughly 30 percent more energy-efficient than chips made using DUV optics.

Light source/
illumination system

Mask

Projection optics

Wafer



How EUV Lithography Influences Microchip Sustainability

ZEISS, working together with its strategic partner ASML and a large network, has brought this technology to the next level through a development process that has lasted over 20 years. The result? EUV lithography (EUV = extreme ultraviolet).

EUV projection optics are capable of high resolutions, which lets them manufacture very fine structures that allow for many transistors (miniature electrical switches) to be put on the microchips. Processors become more powerful as the number of transistors per chip grows. The development has been progressing for over half a century, with a phenomenon known as Moore's law (named after Intel cofounder Gordon Moore) claiming that the number of transistors on a microchip doubles every two years. ZEISS and its partners have also had a hand in this progress.

What impact does higher performance have on sustainability? "EUV chips are, among other things, roughly 30 percent more energy-efficient than chips made using the most recent generation of deep ultraviolet (DUV) optics. This makes it possible to build significantly better-performing devices without enlarging their carbon footprint," says Birgit Kürz, who works in product development and is a member of the Sustainability Team.

The research team was awarded the 2020 Deutscher Zukunftspreis (the German Future Award) for the technological quantum leap of EUV lithography. This video provides more information:



How ZEISS Is Making Optical Production More Sustainable

Product development has a fundamental role in the optimization of lithography systems, in terms of performance as well as sustainability.

"The most important thing is to get a clear idea of the consumption and emissions that production causes, and that means measuring >>

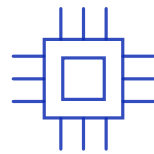
key performance indicators. You can't improve things if they are not measured," adds Ingo Hofmann, Project Manager and a member of the Sustainability Team at ZEISS Semiconductor Manufacturing Technology, "We are currently building up our basic data. When it comes to sustainability, we study what impacts we have on the environment right from the product development stage. After we have done this, we can ask ourselves, 'How can we reduce these impacts?'"

This process has already produced helpful findings. "Energy is the biggest lever at our disposal because our processes and production operations have such high demands." What he is referring to here are clean rooms, the spaces in which ZEISS manufactures the lenses and mirrors for lithography optics. The requirements for air purity are very strict. "Our energy consumption is high because we need heavily air-conditioned clean rooms. Nonetheless, we are constantly improving our infrastructure." For example, consumed energy is reused smartly and process waste heat is reclaimed in heating systems. "Microchips are used for this as well," says Ingo Hofmann, "They form the basis for intelligent switches that we can use to optimize our production halls." His team questions everything: Does the machinery need to be in the clean room, or would a less energy-consuming area suffice too? The latter can reduce the area needed for clean rooms, which in turn has a positive influence on energy consumption. This is something that ZEISS looks at closely when moving into newly constructed buildings. It is also just as important that employee awareness is raised. "Which processes can

we improve? How can we stop machines from being on standby for an unnecessarily long time? The ZEISS mindset is known to be about efficiency and precision, and our aim is to refine this mindset in relation to sustainability, too," says Ingo Hofmann.

There are also initiatives that can be taken for resource consumption. "We are currently looking at using 'green steel.' Manufacturing steel consumes a great amount of electricity, so it is usually associated with significant carbon emissions. If the electricity used for it is generated from renewable sources, this process can be completed in a considerably more sustainable way," says Tobias Berndt. However, crucially, he adds, "There is always a question you need to ask: How was this electricity made 'green'? Through carbon offset certificates – which generally are OK – or by actually using renewable energies with power purchase agreements (PPAs)? The latter is even better because in this case no carbon dioxide was ever produced and therefore there was no need for it to be offset afterwards. This is something we are investigating right now."

>>



57

billion transistors

go onto one microchip.
In 1970, only 1,000 did.





The Next Steps toward More Sustainability

“Investigating” is a fitting choice of word, as Tobias Berndt and his team are currently working on a comprehensive program for establishing sustainability within ZEISS Semiconductor Manufacturing Technology and for approaching the topic strategically. They use nine core questions to align themselves with the Group’s targets and initiate projects to achieve the targets. The team is constantly on the lookout for new, promising ideas for projects. Tobias Berndt says optimistically, “As a manufacturing company, we are aware of our responsibility for sustainability, and this awareness is growing among customers and suppliers, too.”

“Our employees feel greatly motivated to work on this issue. This is how we drive innovative solutions.”

Tobias Berndt


Sustainability Project Manager
at ZEISS Semiconductor
Manufacturing Technology





Taking Retro to the Future: ZEISS PerformanceFit

New does not always mean better, at least not for the climate. That is why there are two big questions to ask when purchasing new devices. First, is it economical? Second, is it sustainable? ZEISS Industrial Quality Solutions has developed a solution for bringing machines in line with the latest technological progress and for conserving resources and lowering carbon emissions at the same time. Called PerformanceFit retrofitting, ZEISS promptly received acclaim for it.

 **60%**
performance increase
for old devices

 **Up to 20**
-year-old devices
can be retrofitted

The Future Firmly in Sight

As a manufacturer of solutions for quality assurance, ZEISS helps its customers to achieve their carbon emission reduction targets. Dr. Marc Wawerla, CEO of ZEISS Industrial Quality Solutions, looks not only at his company’s own sustainable methods for adding value, but also at his customers’ energy consumption and demand, and ways to improve them. “We seek to help our customers to improve their own carbon footprint by reducing emissions with optimized quality solutions and more precise measurements,” he says.

Award-Winning Innovation: ZEISS PerformanceFit

With its ZEISS PerformanceFit product, ZEISS Industrial Quality Solutions is blazing a trail for productivity, flexibility, and, above all, energy and material efficiency. Retrofitting, which involves upgrading used goods to bring them in line with technological progress, is an approach that sees the circular economy and the reuse of raw materials as the future.

The experts at ZEISS Industrial Quality Solutions apply particularly innovative product redesigns to enable thoroughly complex and unique retrofits that ensure more resource-friendly operation thanks to modernization. The qualities of PerformanceFit impressed the jury of the 2021 Umwelttechnikpreis Baden-Württemberg (Baden-Württemberg Environmental Technology Award) so much that it awarded the product first place in the material efficiency category.



Innovative and Retro Mixed Together

Measurement devices used for quality assurance must meet all measurement and safety standards at all times. Many industries, such as electrical engineering, medical technology, space travel, and automotive, rely on such machines day in and day out. They demand that these machines work faultlessly, even after decades of usage. Manufacturing new machines requires the consumption of a large amount of resources. So too do machines that no longer have maximum energy efficiency after a long period in service. Altogether, it almost makes for a catch-22 challenge.

Nonetheless, ZEISS has accepted precisely this challenge. Using PerformanceFit, ZEISS brings coordinate measuring machines that are up to 20 years old into line with the latest technology. As a result, their material consumption is reduced, their service life extended, their operating costs lowered, their efficiency increased, and their energy consumption halved. ZEISS achieves these results by examining the devices comprehensively. Potential retrofits are considered from as early as the product development and manufacturing stages so that subsequent upgrades are technologically possible. In usage, a retrofitted device is characterized by its reduced resource consumption, its increased efficiency, and its improved carbon footprint. Retrofitting a device at what appears to be the end of its service life also conserves raw materials and makes further capital expenditure unnecessary. This means that the coordinate-measuring machines that are modernized by ZEISS offer financial as well as environmental benefits.

The machines are fully refurbished and equipped with new modules on site with no more than one week of downtime.

>>



Up to

50%

less energy consumed in measurement operations



2.2t

less CO₂ p.a. with average usage





>>

Large and heavy device components that require large amounts of energy to manufacture are kept in the device and not exchanged. ZEISS AirSaver and ZEISS PowerSaver are innovative PerformanceFit features that also help customers to achieve their carbon emission reduction targets. These features can significantly reduce the energy required during idle times. What's more, the productivity of the modernized machines is optimized thanks to new, digital controls, software features, and sensor interfaces. This lets them take on new measuring tasks flexibly and without consuming resources excessively, all while strongly reducing the energy required. Modernization leaves the machines able to be used efficiently and effectively for at least ten more years so that they can contribute to sustainability during this time.

A Look toward the Future

Retrofitting offers many opportunities and ZEISS is constantly enhancing the process. To help customers with the achievement of their climate targets, ZEISS is currently also working on further new products that improve product carbon footprint. Retrofitting, which can be understood as upcycling 2.0, is the way of the future.

“We have identified over 3,000 customer devices that we could theoretically retrofit using PerformanceFit. Our retrofit solutions mean that customers save not only on carbon emissions, but also on costs. They are a key step toward a more sustainable future, and that is cause for optimism,” says Andreas Gruber, Head of Global Service Product Management & Development at ZEISS Industrial Quality Solutions.

**If you want to see exactly
how retrofitting works at ZEISS,
click here.**





The Future? Think in Circles!

Sustainability means thinking not only from start to finish, but also completely outside the box. Linear thinking is an impediment to circularity, yet a circular economy is the primary model for a more sustainable future. This means that there needs to be a change in thinking in order to find creative solutions that keep raw materials in the material cycle. The material cycle is crucial to sustainability.

“Customers usually only have to deal with packaging for a very short time or they even throw it out straight away,” explains Léon Kunad, Head of Category Management at ZEISS Consumer Products Nature Observation. This is not necessarily a bad thing since a healthy circular economy needs waste that is collected, processed, and reused. It extends materials’ life cycles and in doing so reduces raw material consumption. What is crucial is that businesses plan, design, and make their products and packaging in such a way that the materials used are maintained for the economic system for as long as possible. That means being able to become part of the material cycle again once they have been used.

>>

“We wanted to put a focus on sustainable and recycled materials above all and, in doing so, take a further step toward a successful circular economy.”

Léon Kunad

Head of Category Management,
Nature Observation, ZEISS Consumer Products

ZEISS Aims to Get Better Constantly – Especially with Packaging

Optimizing products and packaging is a crucial way toward sustainability. ZEISS has held up a mirror to itself and taken action. Here is one example: the product bags for newly launched ZEISS products in the Hunting and Nature Observation business field and the cardboard boxes they are delivered in.

“We wanted to put a focus on sustainable and recycled materials above all and, in doing so, take a further step toward a successful circular economy,” says Léon Kunad. It is for this reason that the product bags are made of recycled PET bottles. Over 16,000 bottles in total were able to be recycled this way in 2021 alone; each bag is composed of approximately 2.5 bottles. ZEISS has got off to a successful start and will build on it over the coming years. The



packaging in which the bag is delivered also stands out due to its increased sustainability. The cardboard box has components that can be fully separated from each other for recycling and does not feature any high-gloss film, which is a boon for the environment.

Beyond sustainability, the bags also need to meet requirements of an entirely different nature. They have to be practical, protect sensitive technology, and serve different purposes depending on the field of application. Furthermore, the bags also satisfy demands for sustainability by containing recycled materials and by not including magnetic seals that consume a lot of materials. There is another prerequisite as well: The bags are often used by bird watchers, so they have to be as quiet as possible when being opened. Switching from a clip seal to a zipper took care of this.

On the Stand: How ZEISS Develops and Tests Its Products

So, if the product and the packaging are good, then everything is good, right? Almost. Sustainability also means using products for as long as possible, because production – even when it is sustainable – still consumes resources and energy. ZEISS believes in long life cycles for product packaging and for the products themselves.

How does ZEISS make sure that happens? By carrying out extensive laboratory and quality tests. A focus is put on durability and longevity from as early as the product development stage.

>>





Thermal imaging camera
in a cold chamber

“A large component of our testing is related to the products’ environmental impacts and durability across their entire service life. In these tests, we try to simulate future years-long strain in just a few days and weeks,” explains Stefan Reiser, Senior Scientist in Laboratory & Application Technology.

Products such as the DTI 3 thermal imaging camera are exposed to extreme temperatures and shock loads that might occur during transportation or even use. How do the surfaces react to cosmetic substances? Do the materials lose their qualities under this strain? These are just some of the aspects that ZEISS tests. Having unavoidable factors such as UV radiation, water, salt spray, or dust challenge the products in the laboratory ensures two things: firstly, that the products can withstand their application and, secondly, that the products are made longer-lasting so that their materials stay in the cycle for longer. If a product does not pass the tests, it must be evaluated, optimized, and tested again.

Not the End, but Just the Start: Repairs at ZEISS

Reduce, reuse, and recycle are the key words of the circular economy, but there is one more “R” that should be mentioned: “repair.” Sometimes, when products are used extensively, a repair is exactly what they need. ZEISS offers strong support services so that its customers can enjoy their products for longer. In addition to repairs and maintenance, ZEISS also keeps spare parts in stock for all current products and many discontinued ones. This service extends the life cycle of the products and therefore the materials used. It closes the loop – for sustainability and for ZEISS. What

else is in the works? “We have not reached our end goal yet. We are constantly developing and making use of new and even more sustainable materials and technologies. We can and want to keep getting better,” concludes Léon Kunad.

“We have not reached our end goal yet. We are constantly developing and making use of new and even more sustainable materials and technologies. We can and want to keep getting better.”

Léon Kunad
Head of Category Management,
Nature Observation,
ZEISS Consumer Products





Lasting Success Through Community

A shared vision connects people from the furthest parts of the world with each other. Collaboration that works well over the long term requires a working culture that is based on trust, common values, shared ambitions, leadership, and empowerment. It needs to use the opportunities that digital transformation offers. ZEISS knows that innovation, progress, and success come from having a good community.

57%



Employees who are motivated by their employer put 57% more effort into their work.¹

Practicing and Developing Shared Values

A company is more than just the sum of its employees and projects. It is the human factor that turns a group into a team. ZEISS combines values and strategy in its corporate culture. The “ZEISS Cultural Journey” guides the conduct of all employees and shapes their collaboration and success. Appreciation and empowerment have a key role in this. ZEISS is aware of this role and has initiated the Culture Ambassador Network, a further important element in the development of its corporate culture. This self-organized, international network has existed since 2021 and is currently made up of approximately 200 employees who make an active contribution to various cultural issues. They have a shared understanding of the guiding themes of empowerment, role modeling, and diverse teams. They act as sparring partners for managers and staff members, helping to firmly establish the topics within the company and among employees.

>>

¹ Source: www.happeo.com/de/blog/mitarbeiter-statistiken-die-sie-kennen-sollten

Cultural Issues at the Forefront



Empowerment

ZEISS relies on trust, empathy, and leadership. Employee empowerment and leadership are factors in how successful collaborative work is. Mutual support is another. These qualities are essential in order for ZEISS to be successful and capable as a global team and stand out as an appealing employer.



Role Models

ZEISS employees are reflective and responsible in their actions because they are aware of their role model status and their influence over their surroundings. For these reasons, they take initiative, suggest ideas, and act in pursuit of their ambitions – and therefore in line with ZEISS values.



Diverse Teams

Having a diversity of personal backgrounds, technical knowledge, and experience is crucial. Diversity and equal opportunities count at ZEISS! A broad-based team with different perspectives offers the best expertise for fostering innovation and giving customers the best support.

“Our attitude is to trust in each other. We trust that everyone wants to do, say, and understand the right thing. And that’s what makes for good teamwork.”

Susan-Stefanie Breitkopf

Member of the ZEISS Group Executive Board, Chief Transformation Officer (CTO)

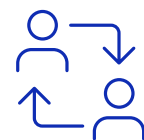




INNOVATIVE INSIGHTS

Traversing New Routes Together

Over the last two years, the way people work together in many areas at ZEISS changed significantly and lastingly due to the pandemic. In many cases, people worked remotely. Adopting flexible working methods helped us to make it through the pandemic successfully. At the same time, ZEISS was able to draw knowledge and experience from this situation for its future collaborative work. It learned that you reach goals by trusting in the team and in individual solutions. This is because there is more than just one right way to do hybrid working. What counts is team-work, results, and productivity, regardless of whether the work is done on site or remotely. It is therefore crucial that ZEISS employees are highly skilled in the digital arena. To make sure that is the case, ZEISS provides a suitable framework, training, and empowerment. Nevertheless, there is another aspect important to Gero Wittich, Head of People Development & Cultural Journey at ZEISS. "It is important that we set aside time for personal exchange and physical interaction, despite the digital world, so that we grow together, support a shared corporate culture, and stimulate creativity and innovation," he says.



75%

of virtual teams globally say that they can work more effectively with the more flexible options for collaboration.¹

¹ Source: www.happeo.com/de/blog/mitarbeiter-statistiken-die-sie-kennen-sollten

“In a context of new challenges such as hybrid working, how can we keep operating as TEAM ZEISS? Our leadership team is addressing this significant task [...]”



Dr. Markus Weber

Member of the ZEISS Group Executive Board and Head of Medical Technology segment

Our employees have their say on LinkedIn under **#teamzeiss**. Be it gender quotas, collaboration, or the challenges faced in different occupations, it is a place for authentic **#realtalk**.

Future-Focused

We feel confident when we look toward the future, especially as we have ideas and people in our company who take on challenges. We are sharing a few of them with you here.

Digital, yet Personal



The last few years in particular have shown that working from a distance does not need to be a disadvantage. On the contrary, connecting virtually often has its advantages. Virtual reality is a helpful technology that is ushering in the future of work. ZEISS has been training its technical support staff around the world in it since 2021, allowing the company overcome national borders.

How VR Training Works

The participants of virtual reality (VR) training are given the necessary hardware and do not have to concern themselves with anything else. The VR training lets our employees come together in a virtual space wherever they are in the world. We make a point of personal interaction even if it is not possible for everyone to get together in person. "It is this mix of methods that makes the difference. Virtual reality, PowerPoint, videos, live remote access – our training equipment enables high-quality and varied remote training that is just as good as in-person training in every way," explains Jan Schmitt, Lead Trainer for Technical Support Engineers, ZEISS Research Microscopy Solutions.

GeminiSEM Update Training

Update training for the GeminiSEM scanning electron microscope was rolled out in April 2021 for ZEISS Research Microscopy Solutions' Electron Microscopy Technical Support team in Oberkochen, Germany. ZEISS has offered it as regular training for technical support engineers ever since. The success of this professional development program speaks for itself – qualitatively and quantitatively.

GeminiSEM Update Training Figures



320

training hours in 2021 through 10 courses



26

people trained from 15 countries globally in 2021



> 150,000

euros saved on unnecessary travel



> 32.5

tonnes less CO₂ by avoiding physical travel

“Thanks to the VR training, I didn’t need to travel out to Oberkochen. It let me spend a bit more time with my family at home after my vacation. And it still felt like I was there with the other participants.”

Alessandro Oliviero

Technical Support Engineer
from Cambridge, UK



Benefits of Virtual Reality Training



Increased training quality through improved visualization of technical context



Reduced costs and boosted productivity from travel expense savings



More usage options for participants, trainers, and local technical support structures



Increased employee satisfaction thanks to greater flexibility

Knowledge Transfer 2.0

VR training is an optimal fit not only for training purposes, but also for refreshing knowledge again later on if needed. The trainers can also demonstrate things that cannot be shown in reality. All this means that the support engineers can more effectively internalize the content of the training. “While ZEISS has not yet exhausted all the potential of VR-based professional development, it will continue to expand on it,” says René Sewcz, Service and Support Specialist, ZEISS Research Microscopy Solutions, “For example, the first batches of training content are already available for additional virtual microscopes. We are also planning a wide expansion of VR-based training to include electron, light, and X-ray microscope systems.”



Virtual Reality (VR) in Use:

ZEISS trains employees globally with methods that include modern VR training.

Sustainability at a Micro Level



Microscopy makes things visible which would otherwise be invisible to the eye. As a result, it drives progress and makes a key contribution to research on topics such as cancer, the environment, materials, and the climate.

Modern electron microscopes enable further insights into and answers to the important questions of our time. ZEISS has been involved in the ongoing development of electron microscopy for more than 80 years, including in making its production more sustainable. ZEISS and INATECH, also known as the Department of Sustainable Systems Engineering at the University of Freiburg, have been working together on a research and development project since 2021. How is it driving sustainability at ZEISS? Where will the journey take them? These are questions that are being discussed by Dr. Roya Akhavan, Sustainability Project Lead at ZEISS, and Dr. Elke Haustein, Project Manager at ZEISS Research and Microscopy Solutions, with their colleagues Prof. Frank Balle and Dr. Sebastian Kilchert (both at INATECH).

Roya Akhavan: Electron microscopy is indispensable in many fields. Sustainability is not yet something that people automatically connect with technology at the moment, so let us start with this question: How is electron microscopy associated with sustainability?

Frank Balle: Electron microscopy is an important tool for us in research and development particularly in relation to biobased materials or materials that we use for technical applications. As part of this, we ask ourselves about factors such as longevity or circularity. Electron microscopy provides us with detailed information

about interface microstructure, which gives us precious insights that we can use to make materials, components, and systems more sustainable or replace them if necessary.

Elke Haustein: It is important that we at ZEISS act on our responsibility and be pioneers, including with the production, delivery, and optimization of our devices. This is how we can keep driving sustainability.

Roya Akhavan: What is ZEISS and INATECH's goal and how are we edging closer toward it together?

Elke Haustein: Our goal is to build a new platform for electron microscopy that will provide the foundation for part of our devices for the next decade. Technology and finance are not the only relevant perspectives, either. Rather, we are also taking sustainability into account. In one-and-a-half to two years' time, we want to offer an electron microscope that suits the current era in terms of the material and energy resources needed for production as well as the resources that are used. Customers should be able to optimize the energy demand during usage.

Sebastian Kilchert: Asking the overarching question of 'How can we make the new platform more sustainable?' has resulted in an entire array of lower-level goals. They see us looking from a variety of perspectives and trying to find new ways to exert influence. Often, the things you can do to become more sustainable are not entirely clear. Our first goal was to demonstrate the specific leverage points that we have.

>>

Roya Akhavan: Key terms or concepts such as resource usage have already been mentioned, but how can a scanning electron microscope (SEM) itself be made more sustainable?

Sebastian Kilchert: A microscope has various impacts on the environment. During its usage, power consumption has a major influence. When it comes to efficient resource usage, that is, manufacturing and material consumption, we can approach it from different angles. At the end of its life cycle, we have other options in the form of different types of refurbishment or recycling.

Elke Haustein: We have been working on improving our environmental impact by taking little steps for decades now. Our biggest levers are suppliers and logistics: Where are suppliers based? How are devices packaged? How are they conveyed? It is also important that we look at our own products: How easily separable are the components? How recyclable are our devices? The entire project team is answering these questions. They are the type that cannot be answered by a single person alone or even by a development team just by itself.

Roya Akhavan: The way this pioneering project is developing is exciting. What are some of our key milestones? Where is the project at currently and what can we still expect from it?

Sebastian Kilchert: First, we examined the existing system and assessed its sustainability through a life cycle analysis. This information then went into many aspects of product development, which we are now looking at in detail. Our next step is to think about the parts that we can actually keep and incorporate when we consider further aspects.

Frank Balle: We have started a major task with the benchmarking for the current system in particular. We now also have a few approaches for packaging and clothing, things that we can easily modify without putting the functionality of the electron microscope at risk. There is quite a bit that we have achieved together, and there is still much to come.

Elke Haustein: We are about to finish predevelopment in the second half of the year, which in this case means the technical feasibility assessment. After that, we will transition to the main development stage. We will use the findings that we have obtained together to keep working continuously on sustainability and create ideas for other projects. This is already partly happening since the awareness surrounding sustainability has also grown within other projects. We are currently taking the first steps together on a very long journey.

Roya Akhavan: We are achieving everything that has been mentioned here through a fruitful partnership between research and industry. What makes you think that we have the right project partners on board and what do you think of our future together?

Frank Balle: The considerate, candid, and constructive dialog in the project team and the shared desire to change things. It makes for a fun experience. I believe that we will achieve great things together in keeping with the spirit of this project.

Sebastian Kilchert: Sustainable development entails a transformation of the entire economy. I think that the people at ZEISS are aware of this. We want to take action and, in conjunction with ZEISS, be pioneers in technological sustainability.

Elke Haustein: Something else that is particularly nice is that our managers are keenly interested and fully have our backs. This gives us the power to set things in motion and put them into practice, and that makes me feel optimistic. It is not just a short-term trend. Instead, we can establish sustainability for the long-term.

Roya Akhavan: Thank you for these positive closing words and the initial insights into the exciting project. It is fantastic being part of it.



The entire project team (from left to right) with Roya Akhavan, Judith Kimling, Elke Haustein, Ulrich Kohl-Roscher, Simon Diemer, Arne Janßen (not in the picture), Sebastian Kilchert and Frank Balle, as well as other ZEISS colleagues from ZEISS Research Microscopy Solutions, is helping us get closer to our goal step by step.



On the Road to ... **Circularity**

Transporting cargo from A to B means generating not only massive amounts of carbon emissions, but also massive amounts of packaging waste. However, this can now become a thing of the past. ZEISS Industrial Quality Solutions, working together with its German and European suppliers, has implemented an end-to-end process that puts a stop to packaging waste.

From A to B and Back

For roughly 10 years now, the kanban process has ensured that a circular economy has been practiced for production logistics at ZEISS. As a result, it has reduced unnecessary packaging waste, freed up valuable working hours, and lessened the products damaged in transit. ZEISS implemented the process in conjunction with its suppliers in Germany and Europe to transport sensitive mechanical and electronic parts, warehouse them, and provide them for assembly safely and without extra expenditure.

>>

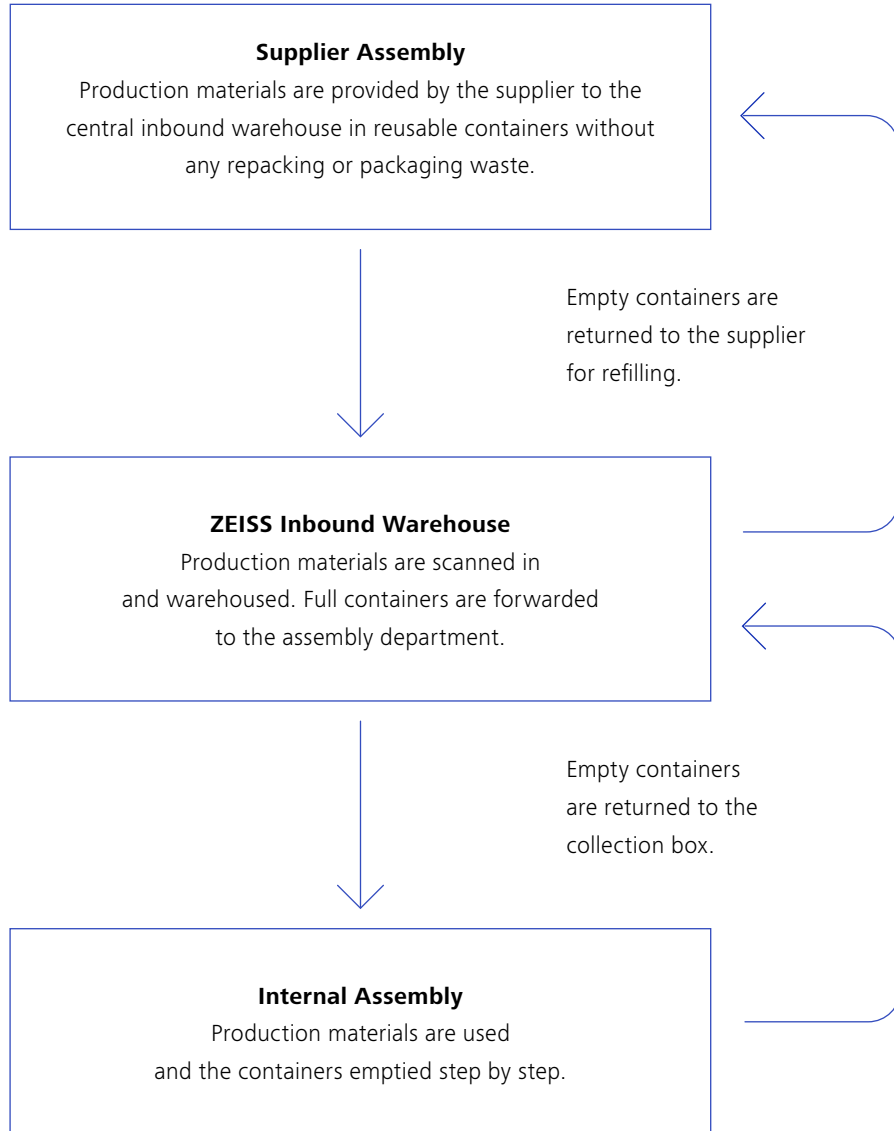
Kanban Containers

Flexible, extendible, and reusable road cases of different shapes and sizes for transporting multiple individual containers.



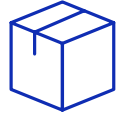
Benefits of the Kanban Process

- Prevention of packaging waste and individual packaging, e.g., boxes and filling
- Extra protection of individual parts with special containers and inlays
- Simplified incoming goods inspection with clear markings
- Easy to warehouse/provision with no un-/repacking needed
- Efficient to transport with materials packed densely
- Emission reductions and low cargo costs thanks to optimized break-bulk cargo



60–70%

less work compared to regular deliveries thanks to the kanban process



2.4–2.8

tonnes less cardboard waste each year (approx.)



9,400

less deliveries in single-use packaging each year (approx.)



1.4–1.8

tonnes less plastic waste each year (approx.)



Going Further in Circles

ZEISS is constantly optimizing the kanban process with its external and internal suppliers. ZEISS is also aware of the challenges, such as special material or batch sizes that could lead to additional operating expenditure for suppliers. Solutions are developed in partnership so that an end-to-end process can be enabled for all suppliers. ZEISS firmly believes in this approach and, for this reason, constantly works on converting even more suppliers and expanding its current collaboration with partners. In their search for further options for sustainability and efficiency, ZEISS employees continually take the spirit of circularity to the next level.

Outlook



Dear Readers,

All the exciting and innovative projects you have just read about are only just the beginning. ZEISS has many more visions and ideas for how sustainability can be taken to the next level.

From innovation in medical technology that creates new hope, to award-winning products that get machines ready for the future, or the optimization of supplier relationships, all of us at ZEISS are constantly looking for new ideas that we can use to drive sustainability. We are therefore embedding sustainability deeper and deeper into our core businesses and are fully committed to this goal. We are going to keep at it and stay upbeat.

As our partners, customers, and – of course – employees, you make an enormous contribution to sustainability with your knowledge, your commitment, and your valuable perspectives. It would be our privilege to continue on our journey to a sustainable future with you.

We look forward to engaging conversations about all things to do with sustainability.

You can access information about our activities in our latest sustainability report at www.zeiss.com/sustainability.html

Contact us directly at responsibility@zeiss.com

Gain inspiration from our exciting, regular ZEISS stories and sustainability activities on LinkedIn:

#sustainability
#optics
#innovation

We look forward to hearing from you.
The ZEISS Sustainability Team

You can find our latest sustainability report here. Or contact us directly at responsibility@zeiss.com



Publishing Information

Find out everything about sustainability at ZEISS on our website. You are welcome to contact us if you have questions, requests, or suggestions. We look forward to hearing from you.

Carl Zeiss AG

73447 Oberkochen
Carl-Zeiss-Strasse 22
Germany
Tel: +49 (0)73 64 20 0
Email: responsibility@zeiss.com
www.zeiss.com
www.zeiss.com/sustainabilityinsights

Editorial Team

Florian Proksch, Dr. Roya Akhavan,
Strategic Corporate Development
Judith Walter,
Corporate Brand & Communications

Design

loveto GmbH
fischerAppelt, relations GmbH

Conceptualization and Text

akzente kommunikation und beratung gmbh

Release date: 21.09.2022

en-INT_36_025_01121

Subject to change in design and scope of delivery and as a result of ongoing technical development.

