

EXCELLENCE INSIDE IN VISUAL INSPECTION



EXPERTISE IN VISUAL INSPECTION
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EXCELLENCE INSIDE HAS JUST THE RIGHT SOLUTION FOR EVERY CHALLENGE.

Visualization systems for the non-destructive endoscopic inspection of equipment and components.

For 40 years, SCHÖLLY has been a professional partner when it comes to developing customized visualization systems with outstanding image quality and innovative product features. From borescopes, camera systems and light modules to complex visualization systems, we offer our customers a wide range of products and services as their partner for optoelectronic inspections.

We aim to find just the right solution for our customers, no matter how unusual their requirements may be. In this respect, visualization is not limited to visible light, but also makes use of UV, infrared and false color representations. We develop micro- and fiberoptic sensors for small and large series. From a single source we offer expertise in optics, illumination, micromechanics, electronics and software, and are therefore able to find just the right solution for a customer's needs.

With our independent manufacture facility, we are able to quickly assemble prototypes and single pieces. Thanks to our fully integrated production facilities located in various places we can always offer the best possible solution for your project.

Being technology leaders in the area of 3D visualization systems, we are able to develop new methods for measuring and inspection tasks, for example in the case of reworking and maintenance or servicing. This results in innovations that offer clarity when working in hollow spaces thanks to the three-dimensionality.

Content

This brochure introduces you to our services in the field of Visual Inspection.

- Our Mission
- Established Standard Products
- Products in Customer Design
- Innovative Customer Solutions
- Technical Variety
- Industries and Applications
- Our Standards of Quality
- Customer Care and Technical Services
- EXCELLENCE INSIDE explains what SCHÖLLY is all about





Small, but dangerous: residues from production.

EXCELLENCE INSIDE FOR EARLY DETECTION OF DEFECTS IN PRODUCTION AND MAINTENANCE.

With SCHÖLLY's products and solutions you can detect the tiniest of defects and ensure sustainable product quality.

Residues from the production process, material damage, incorrect machining or foreign objects can result in degraded quality, decreased performance and consequential damage inside components, machines and equipment which cannot be seen from the outside. In order to detect potential areas of damage early on, SCHÖLLY develops products and solutions that provide the user with clear images of the inside of complex components and equipment.

Our products help production companies perform efficient non-destructive visual inspections to ensure sustainable product quality. Whether for manual spot checks or 100 % inspections – first-class inspection results will give you useful information about the internal condition of your components.

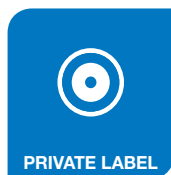
We develop solutions that help to optimize inspection and repair processes. In close collaboration with our customers, we produce endoscopic visualization solutions with added functions, so that you can eliminate damage inside your equipment without the need for time-consuming dismantling.

To give you the benefit of our expertise worldwide, we offer the following range of services:



Products

Procure high-quality standard products for all your visualization needs.



Private Label Products

Sell our products labeled with your brand as part of your product range.



OEM Solutions

In cooperation with you we develop innovative solutions for your inspection and repair requirements within production and maintenance.



SCHÖLLY is an experienced manufacturer of endoscopic devices that in combination offer optimum visualization: Inspection and camera systems, endoscopes, light sources and light guides – all from a single source.



PRODUCTS

ESTABLISHED STANDARD PRODUCTS FROM SCHÖLLY.

Our products set standards for industrial endoscopy.

Our product portfolio offers suitable systems for all different kinds of applications. Whether you want to integrate them permanently into your production process or use them as portable solutions on-site, we offer borescopes and flexible endoscopes for quick spot checks alongside complete inspection systems for 100% serial inspections. For your inspection tasks, we can provide you with devices with large or small diameters, flexible or rigid solutions and modular systems for changing inspection tasks. As a specialist in micro borescopes, we offer a wide range of borescopes and probes starting from 0.35 mm in diameter. Our product portfolio is rounded off by illumination products, software and monitors for optimum visualization.

Our products are distinguished by high quality and an ergonomic and user-friendly design. We base our product development on your needs that arise in everyday inspection tasks and on technical trends and requirements in the industrial environment. This results in unique products with useful properties.

Our product portfolio features the following product categories:

- Inspection systems and cameras with various connection possibilities
- Videoscopes
- Micro borescopes
- Borescopes with or without interchangeable objectives
- Fiberscopes
- Monitors, endocouplers and software
- Light sources and light guides
- Work area illumination and fiberoptics



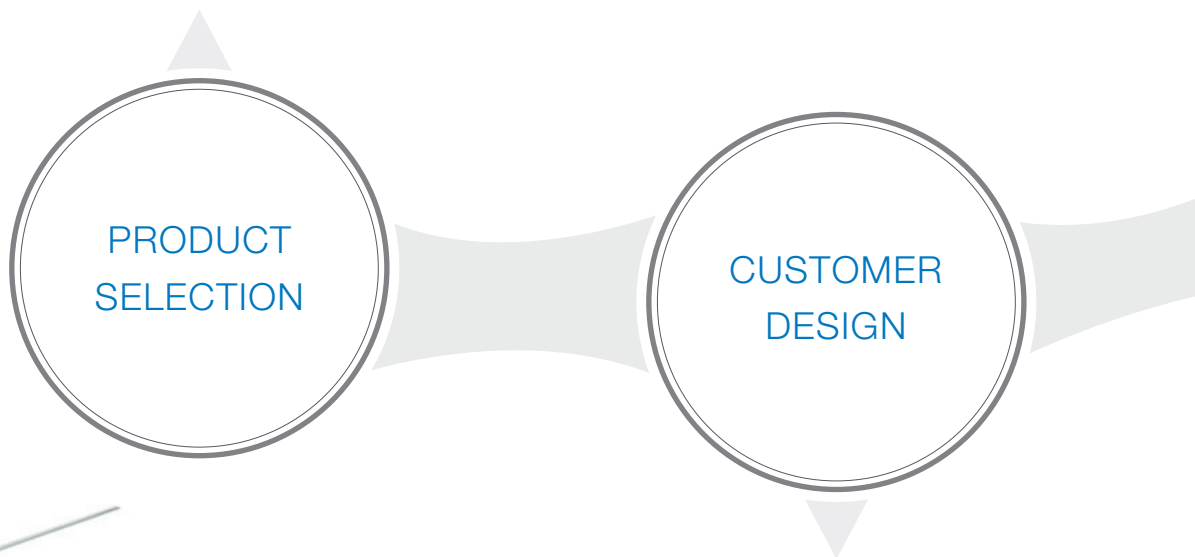
PRIVATE LABEL PRODUCTS

ESTABLISHED STANDARD PRODUCTS IN CUSTOMER DESIGN.

Our private label products provide the perfect complement to your product range – of exceptional quality, competitive and available at short notice.

With our private label product range, we individualize the products from our standard range according to your wishes and corporate design specifications. The private label range is aimed at dealers and manufacturers who want to expand their own portfolios. By adding to your product range you can create clear competitive advantages: You will be able to market new products quickly and save time-consuming, costly development processes.

You can choose from inspection systems, cameras, endoscopes and light sources to add to your product range. We will give you in-depth advice about which of our products will suit your portfolio best.



We adapt your selected products to your corporate design specifications. You can choose the housing colors, front cover design and labeling for inspection systems, cameras and light sources and the color scheme of the camera heads in some designs. For the endoscopes we have a variety of bodies, surface finishes, laser inscriptions and ocular colors to choose from. The higher the number of units, the more possibilities there are for your design.



PRODUCTION & DELIVERY

By producing and storing our assemblies in a neutral design, we are able to implement design changes quickly and offer a prompt delivery.

SERVICES

Attractive offers for the technical service of your products complete our portfolio. Wherever you are in the world, our service centers provide exceptional support for your products. Our highly qualified service technicians take care of the necessary steps as required. From traditional repairs to exchange concepts, we work with you to define the most appropriate package for your requirements, prevailing local conditions.

IMPLEMENTATION

As soon as we have received all the information we need from you, we quickly start implementing your requirements. We prepare the drawings and return them to you for approval and define individual bills of material for your products in our system.



Our development teams design customer-specific solutions and the manufacturing department creates initial prototypes.



OEM SOLUTIONS

WE TURN YOUR IDEA INTO A SUCCESSFUL PRODUCT.

You have a challenge or an idea, while we have the expertise to transform it into successful solutions.

Many successful products are the result of a desire to improve something that already exists, identify new possibilities in relation to an unsolved problem, or explore new technological, economic, or ergonomic methods. When our customers' concrete application expertise is combined with our specialists' experience, the result are innovative solutions.

SCHÖLLY develops intelligent solutions for use in the area of quality assurance of complex mechanical components and non-destructive testing-solutions to increase the long-term productivity and competitiveness of our customers.

For the area of maintenance, repair and overhaul, we develop visualization solutions to be integrated in the customer's inspection and repair processes. Damage inside equipment, caused by daily operation, is both detected and promptly rectified.

In doing so, we offer our customers and partners more than simply fulfilling standards. We maintain a dialog to identify specific requirements and seek out the best possible solution. We always pursue the goal of developing innovations and solutions that offer both technological and economic advantages. The result of this close cooperation are trail blazing products.



Increased efficiency: Remote visual inspection procedures are combined with the customer's repair tasks.



OEM SOLUTIONS

CREATING INNOVATIVE SOLUTIONS WITH VISUALIZATION PLUS.

Visualization Plus, the clever combination of endoscopic inspection with repair tasks, can accelerate processes and minimize equipment downtimes.

Wherever downtime of equipment or machines can cause significant losses in revenue, Visualization Plus can help optimize the process. Visualization Plus is a new solution for maintenance and repair, which is different from previous visualization solutions. This solution combines endoscopic inspection with the necessary repair functions. Damage in machines and equipment can therefore be repaired on the spot. This helps to avoid time-consuming, costly dismantling.

Visualization Plus solutions are used in aviation, among other industries. During engine maintenance, the turbine blades are visually checked for damage and contamination. In collaboration with a major engine manufacturer, SCHÖLLY developed a customer-specific visualization solution with a cleaning function. Equipped with a camera and LED light module, the endoscope solution provides informative images of any dirt or contamination inside the engine. The central high pressure nozzle attached to the endoscope tip reliably removes stubborn contamination with a water pressure of several 100 bar. A costly dismantling of the engine can therefore be avoided.

Visualization Plus solutions are adapted to the process and repair requirements of the customer. Both 2D and 3D solutions are possible, as well as manual or automated systems. Various functions can be integrated into the endoscope solution as required. These can be, for example, measuring of damages, removal of foreign objects or the repair of damaged components.



Example of a Visualization Plus solution



Steerable endoscope system with central high pressure nozzle, camera and illumination in a guide tube (white)

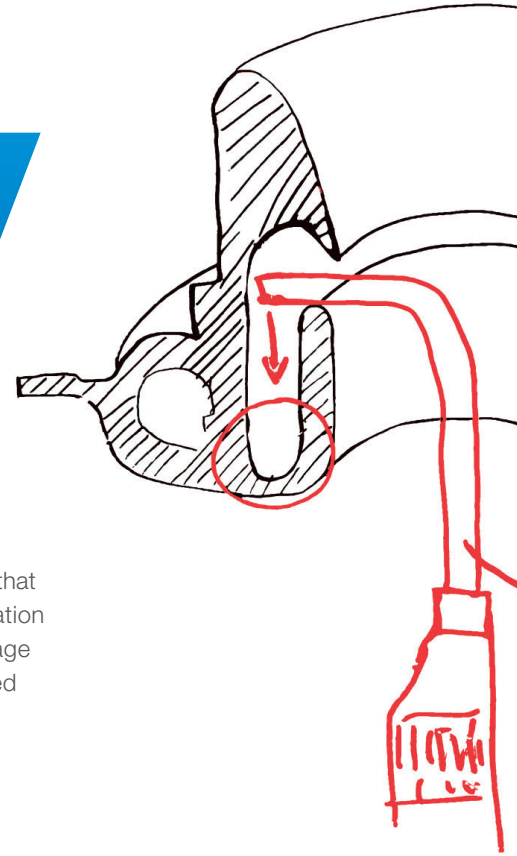


Visualization and high-pressure cleaning



SCHÖLLY excels at developing unique solutions for endoscopic applications in partnership with the customer.

EXCELLENCE INSIDE ALL THE WAY TO A MARKETABLE PRODUCT FROM ONE SOURCE.



Turnkey systems or modular services – We'll take care of it.

From the initial idea through to our global service, we provide custom-fit solutions that meet your requirements. To permit the creation of a new, future-oriented visualization solution, our experts are on hand to guide the project optimally through every stage of the process. A product will not move to the next stage until it meets the defined requirements.

CONCEPTION

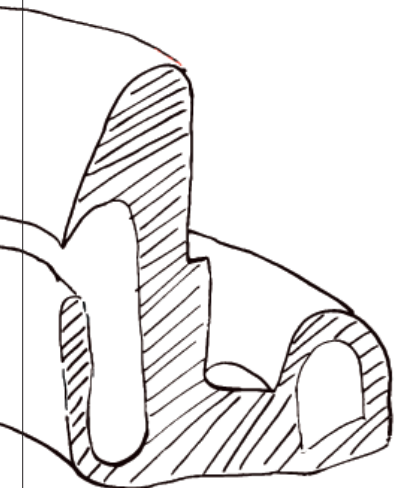
PROTOTYPING

ENGINEERING

An interdisciplinary team of specialists works with the customer to come up with the best possible solution to a specific problem from both a technological and economic standpoint. The goal of this conception phase is the mutual preparation of an initial specification document.

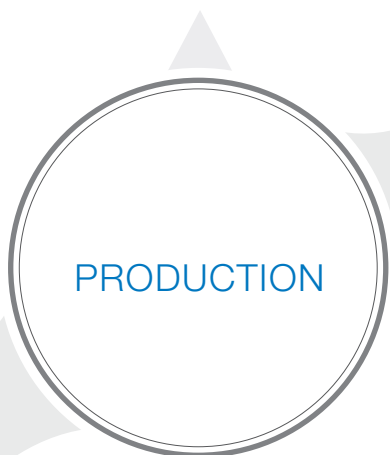
A special fast-track production process and a hand-made manufacture allow us to work faster and prevent severe concept errors, which would not be viable with normal processes. The goal of this prototyping stage is the mutual preparation of a comprehensive specification document outlining the next steps. This early evaluation of the product provides our customers with an important competitive advantage.

Based on the approved specification document, a team of specialists in the fields of micro-optics, mechanics, electronics and software develop the product in our development center in Denzlingen. In this context, our main focus is on highest quality and the ability to produce large and small quantities in a cost efficient process. Our teams work in line with defined milestones. At this stage, developing suitable service concepts is already an integral part of our work.



Our high level of vertical integration – particularly when it comes to critical components such as lenses, software and cables – gives us the ability to conduct continuous quality controls with short lead times. Production facilities around the world, modern machinery and regular trainings all serve to safeguard our high standards of quality. Individual pieces and small batches can be produced at our manufacturing facility in Denzlingen, Germany. This allows to respond quickly to our customers' needs.

FlexiScope
special solution



Attractive offers for the service of our products complete our portfolio. Our worldwide service network offers a high level customer service and modular service concepts, tailored to local conditions. Regular audits of our service centers ensure highest quality with uniform processes, equipment and tools.

Early on in the development process, a team comprised of approximately 20 specialists ensures that our products comply with international standards, in order to obtain all the necessary certificates and approvals. Before a product is approved for serial production thorough tests with regard to functions and practical application are carried out with the involvement of the customer and users.



Employees from product management, manufacturing department and sales work together to develop solutions for a customer's requirement

EXCELLENCE INSIDE
TECHNICAL VARIETY FOR
DIFFERENT REQUIREMENTS.



BORESCOPIES FOR EXTREME ENVIRONMENTS



Our borescope solutions are adapted to the conditions in question, temperatures of up to 2,000 °C, high pressure, aggressive chemical substances, highly dusty or humid environments or radioactive environments and are integrated into complex systems according to the requirements. Field of application: e.g. in energy plants for process observations.



STEERABLE ENDOSCOPE SYSTEMS



In addition to a camera module and LED illumination, the endoscope system has a central high pressure nozzle for cleaning stubborn deposits. The remaining free working channels enable the integration of functional modules. Field of application: e.g. in aviation.



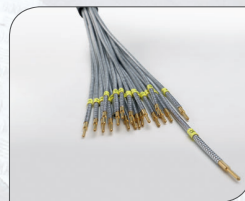
MOBILE SOLUTIONS



SCHÖLLY is keeping pace with the trend of providing mobile solutions and offers sophisticated systems for the on-site inspection and documentation of facilities and production process components. These include lightweight, portable and battery-operated videoscope systems with a recording function. Field of application: e.g. in wind energy plants.



MULTIPLE OPTICS AND POLYP SYSTEMS



We develop multiple optical systems for the simultaneous inspection of several areas within a component using up to 20 endoscopes. It allows viewing from various perspectives during inline controls. The results can be evaluated quickly and easily by attaching an image-processing system. Field of application: e.g. inspection of bottle necks during production process.

EXCELLENCE INSIDE IN THE ENTIRE RANGE OF TECHNOLOGICAL POSSIBILITIES.

ENDOSCOPIC ACCESS TO THE INSPECTION OBJECT

Micro borescopes starting from 0.35 mm



We offer micro borescopes and camera systems with temperature resistance up to 135 °C, moisture-resistant and gas-tight. In production they are used to check long, thin drill holes and in the field of security to avert danger and to protect the security forces.

Steerable videoscopes



For difficult-to-access inspection sites, SCHÖLLY develops flexible probes that can be deflected in different directions.

SYSTEM INTEGRATION OF VISUALIZATION

Ergonomics



Simple and comfortable handling and an appealing product design not only make it easier to use the devices, but also increase the user's comfort factor when doing so. That's why we actively involve users, industrial designers and engineers in the development process.

Integrated solution



In close collaboration with customers, SCHÖLLY develops customer-specific solutions of which visualization forms an integral part.

Modular designs



Differing tasks require flexible product designs. Modular designs mean inspection systems can be adapted to the inspection task at hand.

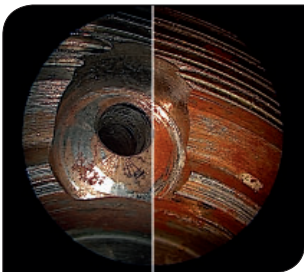
Modern housing concepts



Maximum carrying convenience, simple transportation and the size and weight of the devices are key prerequisites for working ergonomically. Based on the principle of "design follows function", we develop designs that satisfy the requirements of the application situation in terms of arrangement and the choice of interfaces.

VISUALIZATION AND DOCUMENTATION OF INSPECTION RESULTS

Video algorithms



By means of various videoalgorithms, additional image information can be gained during the inspection. The videoalgorithm „Selective color enhancement“ for example enhances a defined color shade such as corrosion brown.

2D- and 3D Chip-in-Tip systems



Increasingly smaller image sensors are making it possible for the endoscope and camera to be incorporated into a single unit. As a result, our developers are able to explore new product ideas that would not have been technically possible until now.

Micro lenses and lens assemblies



We develop, manufacture and coat lenses from 0.25 mm to 19 mm in size and produce complex objective lenses and assemblies.

3D HD endoscopes



We have successfully manufactured serial 3D endoscopes for 15 years. Natural, stereoscopic vision is a key benefit for the user with regard to working intuitively in three-dimensional space.

Documentation



For improved traceability and the evaluation and documentation of inspection results, SCHÖLLY develops inspection systems with a recording function. Depending on the product design, inspection images and videos can be saved onto SD cards, USB sticks, software or laptops.

LED light sources and fiberoptics



The development of powerful light sources and light guides is one of SCHÖLLY's core areas of expertise. Lighting possibilities range from xenon to LED to laser light, regardless of whether they are built in close to the endoscopes – for example, directly into the handle, into the camera unit, or in a separate lighting unit.

EXCELLENCE INSIDE ENSURES INFORMATIVE RESULTS IN VARIOUS INDUSTRIES.

Our endoscopes, inspection systems and customer-specific solutions support our customer's value creation process in various industries. Incorrect processing, scratches, cracks, burrs or deposits during production or maintenance can be detected early on, corrected and the source of the defect eliminated.

INDUSTRIES



Aviation and aerospace

In aircraft maintenance, the engine, landing gear and tank are all inspected using endoscopes. To ensure a high level of availability, maintenance is carried out on on-wing to avoid any time-consuming dismantling. In addition to videoscopes, borescopes and micro borescopes or customer-specific solutions from SCHÖLLY are applied.



Automotive

High quality standards in the automotive industry require the visual inspection of components during the production process. In addition to safety-related components, such as the brake or airbag systems, visual inspections are also required for the engine, drive train, injection system and exhaust gas system.



Energy and power plants

Maximum efficiency and reliable operation is the aim of energy production plant operators. The regular maintenance of wind power plants and nuclear power plants required visual inspections of gears, turbines and bearings, for example.

Automation

SCHÖLLY develops integrated solutions (visual inline inspections) together with the user for automated 100% visual inspections. Defective parts are automatically identified and separated out according to defined criteria. SCHÖLLY offers expertise in optics, camera and illumination, as well as 3D visualization and develops specific solutions in collaboration with the customer.



Security

Observation of people by the police and military, cavity inspections by customs officers or evidence analysis in forensic laboratories require first-class visualization solutions. Micro borescopes, videoscopes, audioscopes and endoscopes with integrated microphones are the optimum tools for these kinds of observations.



OUR PRODUCTS AND SOLUTIONS DELIVER PRECISE RESULTS



Inspection of drill holes to ensure they are free of burrs



Inspection for wear and corrosion in maintenance

EXCELLENCE INSIDE IS ALWAYS AN INVESTMENT IN THE FUTURE.

Innovations for the future with strong partners and successful partnerships.

SCHÖLLY continuously invests in the improvement and development of technological solutions. In addition to our close and often long-term cooperation with OEM partners, we also collaborate with leading universities and research institutions. Direct access to basic developments and our visions of the future of visualization systems result in concrete technological developments.

Both on a project basis and as a member of long-standing networks, we work with partners who complement each other perfectly with their areas of expertise.

Some of our strategic partners in Germany are:

- Universität Freiburg - Department of Microsystems Engineering (IMTEK), Freiburg
- C.R.S. iiMotion, Villingen-Schwenningen
- Hahn-Schickard Society for applied research, Villingen-Schwenningen



EXCELLENCE INSIDE IS OUR QUALITY STANDARD.

Our comprehensive understanding of quality goes far beyond the product itself.

Our success is based on many years of experience, the quality and reliability of our work and the enthusiasm of all those involved in the development process. The continuous search for new solutions is clearly visible in our open culture of innovation, which is firmly established in the heads of all employees. By questioning existing processes and structures and making advancements to existing products, we succeed in working in a structured manner while still remaining flexible. Skilled and motivated teams are a key requirement in this regard and this is an aspect that we pay considerable attention to. This is because we can only meet our EXCELLENCE INSIDE standard by working together.

Our products are used in applications in which our customers have to have complete faith in their quality and reliability. We make sure that the possible risks are examined, evaluated and eliminated in the early stages of the development process.

SCHÖLLY products fulfill all relevant standards. If the products are to be used in areas in which additional licensing is required, the necessary steps are agreed upon with the customer early on. In this respect, our customers benefit from many years of experience in medical registration processes.

Running our own testing laboratory for the relevant preliminary tests helps us to keep a check on the quality we deliver in practice.

What quality means to SCHÖLLY:

As a result of our high responsibility to offer customers, patients and users the highest standards of quality in all our areas of business, this issue is a top priority for SCHÖLLY.

- The name SCHÖLLY stands for innovation, reliability and quality both in Germany and around the world. Our approach to business and our actual operations are centered entirely around the needs of our customers.
- The high quality of our products and our aspiration to constantly improve ourselves are one of the many reasons that SCHÖLLY has proven to be a competent partner in different areas.
- Our internal standards of quality are determined by our customers, our own benchmarks, as well as national and international standards.
- The purpose of these standards is to ensure that our products are safe and reliable to use.

EXCELLENCE INSIDE IS PART OF OUR SERVICE.

For SCHÖLLY, service means more than just repairs.

We believe a consistent customer focus also means offering our customers high-quality services. Individual service packages that we define with our customers in the early stages of the development process along with the creativity, expertise and the high standards of quality that our service professionals possess all guarantee our customers' satisfaction. Before our products even arrive on the market, we make sure that our dealers and users have the necessary product knowledge. We provide targeted product training, train-the-trainer courses and specific product documentation to ensure everyone has the information they require.

We not only repair and maintain SCHÖLLY products, but also offer an exchange program for endoscopes from other manufacturers or otherwise attractive terms for an upgrade to the latest SCHÖLLY quality.

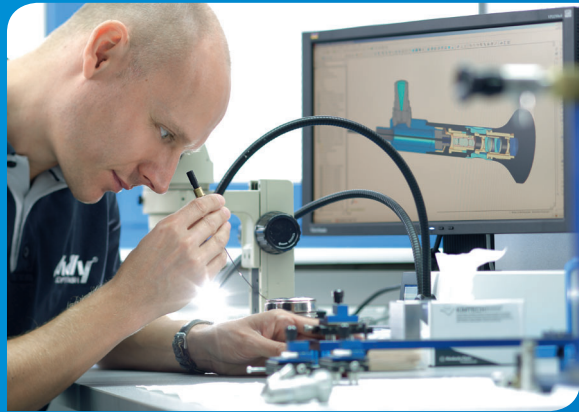
Within our worldwide service network, we offer customers competent local assistance and support in their native language. As a result, we guarantee prompt and reliable service, uniform quality across the globe and a matching price level. Our customers benefit from the process cycle in a modern company that operates in accordance with the highest standards.

SCHÖLLY Service Europe



SCHÖLLY Service North America





SCHÖLLY Service Asia



SCHÖLLY Service South America



EXCELLENCE INSIDE EXPLAINS WHAT SCHÖLLY IS ALL ABOUT.

A family business operating worldwide as a corporate group.

Even at the company's foundation in 1973, its founders Regula and Werner Schöllly had a clear aim in sight: to manage a grassroots company that pursued its own ideas with courage, vision and its own venture capital.

SCHÖLLY soon evolved from a single-device manufacturer into a provider of complex visualization systems, driven by a desire to develop the perfect product for its customers and their specific requirements.

Today, the SCHÖLLY name stands for expertise in making the invisible visible with the aid of micro-optics, fiberoptics, mechanics, software and electronics. We develop and manufacture all of the elements required for this — from the endoscope through to the complex visualization system.

Our combination of technological superiority, strategic foresight, a spirit of cooperation and accountability is what truly sets us apart.

As an independent family business that embraces innovation and dynamism, we offer dependability, expertise, creativity, fairness and respectful openness in our dealings with customers and employees. This philosophy has been the bedrock of our success for more than 40 years. Today, as an international family business, we have approximately 350 employees at the Denzlingen site and about 550 employees worldwide.

We have two areas of focus:

Medical Endoscopy

Endoscopic visualization for minimally invasive surgical and diagnostic applications.

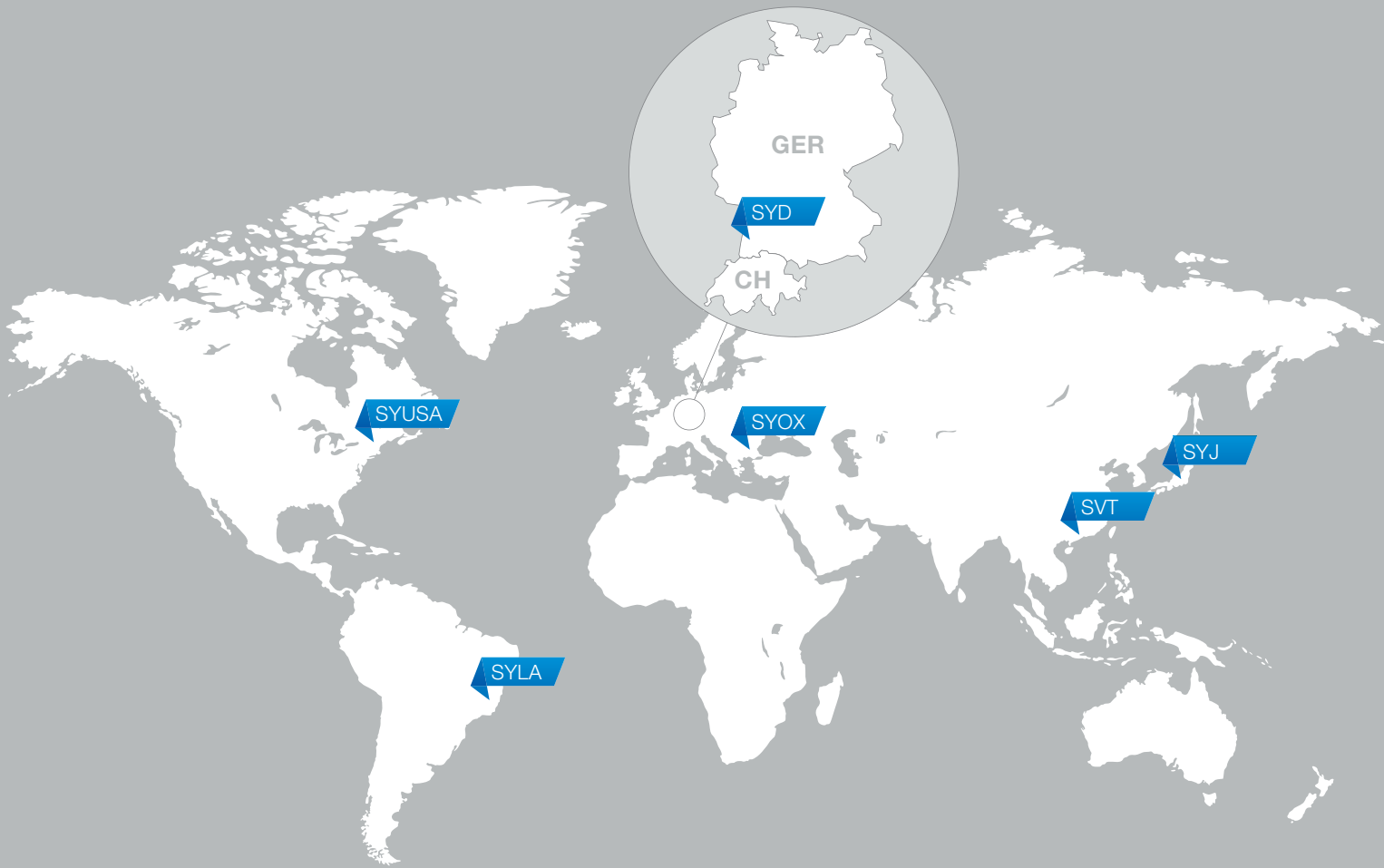
Visual Inspection

Complex visualization systems and modules for industrial inspection activities.

EXCELLENCE INSIDE

Explains what SCHÖLLY is all about, as...

- thereby we give customers and partners a promise
- we think ourselves in our customers' requirements
- thereby our high expectations towards ourselves, our products and services become apparent
- it reflects the skills and motivation of our employees
- it stands for the quality of our components
- it describes the enthusiasm for what we do



● ● ● **SYD** **SCHÖLLY FIBEROPTIC GMBH**
Denzlingen, Germany

● **SYJ** **SCHÖLLY CORPORATION**
Saitama City, Japan

● ● **SYOX** **SCHÖLLY OPTIX OOD**
Panagyurishte, Bulgaria

● ● **SYUSA** **SCHÖLLY USA INC.**
Northborough, USA

● **SYLA** **SCHÖLLY LATIN AMERICA LTDA.**
Belo Horizonte, Brazil

● **SVT** **SCHÖLLY VISUALIZATION TECHNOLOGIES CO. LTD.**
Guangzhou, China

FUNCTIONS

- Research and Development
- Production
- Customer Support and Technical Service

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