Let us be your guide through the world of glass
Grenzebach and CNUD EFCO GFT offer a seamless glass engineering experience.

Flawless glass manufacturing starts here – in the hot end.

The tin bath – endless fascination

The annealing lehr for quality glass

Waste heat recovery – a green approach

Utilities and central power supply – an eco-friendly feed stock solution

The cold end, destined for flexibility and reliability.

Seamless conveying

Dynamic cutting technology

Metrology – good data means better results

Stacking technology – good stacking means better glass

Glass coating technology for that functional and attractive finish.

Glass with added value

Future-proof lab coater

Integrated control

Smart, connected and transparent processes all along the line.

Integrated production logistics

Staying on track with product traceability

SERICY. A data powerhouse.

Plant operation and control that’s a breeze.

Intuitive user interfaces

Lower workloads, higher availability

WeService. Premium service – and that’s a promise.

Grenzebach service to exceed expectations.

Enthusiasm starts with excitement.

Today, we speak from experience.

Coating technology. Or the feel-good factor.

What will the future be like? Be a part of the journey with our digitalization solution for tomorrow’s glass production.

We live Service. Partnership and service that go the extra mile.
Glass lets us gaze out onto the horizon or view the world and what it has in store under a microscope. The material is thousands of years old and reveals new facets of itself each and every day. It fascinates and empowers us to work tirelessly on technological innovations so that we can help you exploit its full potential.

Experts from many disciplines push boundaries because glass is in their DNA. They also understand the bigger picture. Architects use glass to create eye-catching buildings. Manufacturers produce this glass in exceptional quality and repeatedly break new ground in the process. They are backed up by a whole team of developers, engineers and programmers whose day-to-day mission is to discover what further potential glass can unlock.

We’re delighted to be part of the journey that glass takes us on. Our approach is optimistic but we cast a critical eye when required. We’re a partner who thrives on bringing our expertise to the table, kick-starting innovations and improving overall experience from start to finish.

At the same time, we also want to team up with you to ensure that future generations can fully enjoy the appeal of glass. Glass can play a key role in combating climate change and making the transition to green energy happen. For example, building modules that produce electricity from solar power. Today, waste heat from the manufacturing process can already be used as a source of energy. Hydrogen or electricity from renewable resources could run production lines in tomorrow’s world. Glass is naturally planet friendly. It can be recycled and melted down repeatedly while retaining all of its unique characteristics.

Enthusiasm starts with excitement.
Anyone glancing through a wrought-iron window in a historic building, castle or church will immediately notice what a difference float glass technology has made. You can look right through the glass without any optical distortion. Grenzebach and CNUD EFCO GFT have been shaping the story of float glass technology from the outset. Our wealth of experience benefits our customers all around the world.

Sand, lime, dolomite and soda are all used to make the exceptional material that is glass. The ingredients melt at a temperature of 1,400 degrees Celsius, or 2,552 Fahrenheit and turn into glass. The basis is a liquid that remains transparent when it solidifies and is very stable. The float glass method is the most successful in the history of flat glass production, which goes back thousands of years.

Grenzebach and CNUD EFCO GFT have been supplying production and processing machinery for industrial float glass from the very beginning. Since the 1990s, we’ve been technology pioneers in this sector. Today, way more than half the panels of glass fitted in buildings are based on Grenzebach technology and/or produced by CNUD EFCO GFT.

There’s no end to the variety of ways glass is used. But regardless of whether it’s architectural glass, automobile glass, patterned glass, thin glass, wired glass or customized glass, special machinery is required to make, fabricate and convey it. With over 300 systems installed internationally, Grenzebach and CNUD EFCO GFT are hugely experienced in the sector. Our experts are the people you can bounce ideas off of and vice versa. They’ve been in the business for many years, know all equipment and technology involved and on-site collaboration builds trust.

To harness the power of technological progress in your interests, we see our role as anticipating future challenges and asking critical questions above and beyond the project we’re currently working on.

With production sites in four time zones and service centers in many countries, we’re never far away and can be contacted remotely or locally.

Today, we speak from experience.

Glass is one of the world’s oldest materials and has achieved a quantum leap thanks to float glass technology. We provide end-to-end support to float glass manufacturers and I’m always impressed each time I walk down a production line. And that really motivates us as a team to break the mold and make the technology even better for our customers.

Egbert Wenninger
Chief Commercial Officer
We view all parts of the float glass production line as one. This approach is beneficial in terms of technology and makes communication easier because there is one single point of contact. Data from all the sections are pooled and help create the added value digitalization offers.

Today, more than 300 float glass production lines worldwide use Grenzebach cold-end machinery. As a market leader renowned for providing solutions for annealing lehrs, float baths and accessories, CNUD EFEMO GFT has been also involved in fitting out over 300 production lines.

Both companies’ experts already know one another from past collaborations and share the same passion for innovations and superior quality.

We want to make your processes easier, less complex and minimize risk to you. Reap the following benefits that two global players provide:

» One stop shop
» Technology integration across the board
» Focused, precision engineering
» Less project management required by customers
» A standardized control concept, fewer interfaces
» Plant and equipment design in 3D and via simulations
» Intuitive glass plant operation
» Digital solutions for better output, quality and efficient resource use
» Joint focus on energy efficiency and a better carbon footprint
The float process is based on a revolutionary idea by Sir Alistair Pilkington where molten glass is poured onto a bed of molten tin. This method is the basis of industrial flat glass manufacturing up until today.

The molten glass is fed into the tin bath, which contains molten tin in an inert gas atmosphere. The glass mass spreads over the molten tin and forms a continuous ribbon. The underside of the glass floats onto tin in the tin bath and is heated from above to achieve a distortion-free and exceptionally high-quality glass ribbon and planarity on both sides.

In the tin bath, the temperature of the glass drops from 1,050 degrees Celsius or 1,922 Fahrenheit at the inlet to around 600 degrees Celsius or 1,112 degrees Fahrenheit at the outlet and the glass ribbon leaves the tin bath in a formed and pre-hardened condition.

CNUD EFCO GFT supplies the entire tin bath:
- Suspended tin bath roof, roof casing, heating elements
- Top rollers including a camera system
- Coolers
- Venting system
- De-drossing pocket
- Dross box
- etc.

A 3D design simulation makes a better variant possible. The dependencies of atmosphere, tin, glass and temperature in the whole tin bath can be simulated and analyzed first via a 3D design. The findings pay dividends because float bath technology is enhanced even further.

Once it leaves the tin bath, the glass ribbon enters an up to 200 meter, or approx. 656 foot annealing lehr. This is a kind of long kiln in which the glass is cooled slowly from about 600 degrees Celsius or 1,112 degrees Fahrenheit to 60 degrees Celsius or 140 degrees Fahrenheit. This controlled cooling process minimizes stresses in the glass, which is vital when processing the glass afterwards.

Therefore, the annealing lehr has a very important role to play. A CNUD EFCO GFT annealing lehr will contribute to a stable glass. In the closed part of the annealing lehr, heat exchangers are used to prevent cooling with ambient air, which prevents contamination during the process and, in turn, ensures better quality glass. We draw on a customized calculation program with a good, decades-long track record and our expertise from 40 years of annealing lehr technology.

Our thickness gage in the hot end measures the thickness of glass ribbons right at the beginning of the annealing lehr. As a result, feedback relevant to the production process is fast. Any deviations from specifications are corrected and resources safeguarded.

» Combined measurements including temperature, glass ribbon width, glass position
» The gage can be retrofitted, even when the machinery is running

The data from the annealing lehr help to enhance the production process even further. They are very important for the cold end and specific analysis creates added value thanks to digitalization.
Climate protection and energy efficiency are huge issues for the glass industry and gaining momentum due to legislation and companies’ own targets. Waste heat recovery can be implemented today, even if the whole plant may be operated with hydrogen in the future. We’re developing agile solutions for the real world each and every day.

Dennis Schattauer
Managing Director German Floatglass Technology GmbH

Our environmentally friendly, waste heat recovery units offer exceptional efficiency, fast energy generation and a high level of availability. They can be used in virtually any conditions a glass melting plant operates under.

WASTE HEAT RECOVERY – A GREEN APPROACH

Two of the glass industry’s key challenges include cutting energy consumption during consumption and minimizing the level of CO2 emissions. We offer a cutting-edge, waste heat recovery system for glass plants so that you can achieve climate targets and ensure you receive your operating licenses in the future. And the combined forces of the Grenzebach and CNUD EFCO GFT teams are working on further improvements.

Both melting the glass and the energy used in the process are inefficient. A large proportion of the energy lost is encountered in the flue gas from the furnaces. Waste heat recovery systems (WHR) use this flue gas by generating electricity and power for heating and cooling processes and air conditioning.

Our WHR means you can start protecting the climate now and saving costs because you purchase less electricity and power.

UTILITIES AND CENTRAL POWER SUPPLY – AN ECO-FRIENDLY FEEDSTOCK SOLUTION

For a float glass plant to operate reliably and at peak performance, it needs a steady supply of energy and other media like natural gas, electricity, inert gas, tin and much more. CNUD EFCO GFT can offer a one-stop solution in this respect. From the start, we liaise with you to plan the supply of energy and media in new plants, extensions or replacements.

As a system solution provider, we have in-depth expertise and experience in delivering energy and media to a whole host of plants. Our objective is to provide a turnkey solution with all the infrastructure, supply lines, sensors and control technology.

We're equally familiar with open and closed loop cooling water systems and supplying technical gases. To provide N2 and N2 inert gas, we’ll find the solution to match your float glass plant.

We combine the high product quality you target with a sparing use of media too. CNUD EFCO GFT is all about green engineering.
SEAMLESS CONVEYING

Our broad portfolio of conveying solutions connects each step in the production line to form a sophisticated and continuous system. Our technology conveys glass gently and precisely – even over distances greater than 100 meters or 110 yards. What's more, our conveying solutions operate smoothly and have long service lives too.

» Conveying systems with specific functions
» Robust, durable, efficient, low on maintenance and emissions
» Ideal, steady material flows

We also have experience with providing tailor-made solutions, such as cleaning devices, or handling customized glass widths of up to six meters or approx. 19.7 foot. We’ll do everything needed to ensure glass is conveyed without any scratches or residues left behind.

DYNAMIC CUTTING TECHNOLOGY

Grenzebach’s cutting and breaking technology transforms the continuous glass ribbon into the sizes required. It allows you to cut glass to size with very minimal product loss.

Longitudinal and cross cutters with force-controlled cutting heads, which are adapted to handle thin, regular or thick glass, score the glass. Cutting pressure is applied precisely based on glass thickness and stress in the glass and by using closed-loop control. The multi-longitudinal and cross cutters can make various formats, even with very small sheets of glass. By changing dynamically to different cutting bridges, formats are produced continuously without any interruptions.

We have a broad portfolio of solutions for cross, center or lengthwise breaks so that the edges are the best possible quality.

Combined with our digital float scan edge camera and look ahead cutting optimization system, we can offer function-rich cutting technology. All in the interests of superior precision, quality and yield.

Defects in the glass ribbon, such as inclusions, bubbles or stones, force glass manufacturers to dispose of the cullet (waste glass) in a cullet bin. Depending on the roller pitch, the shortest cullet plate was 500 mm or 19 \(\frac{11}{16}\) inches long. Thanks to Grenzebach’s short cullet plate system, this figure can be cut to 170 mm or 6 \(\frac{11}{16}\) inches. This is possible because the cullet is disposed of directly after the break roller.

Cutting technology lies at the heart of the cold end of a float glass production line. Combined with the breaking system, the cutting heads, force-regulated controls and an intelligent optimization system form a superbly efficient unit.
As a glass manufacturer, a stable production process is more important than ever these days. Grenzebach’s inspection and measurement procedures stand for advanced control methods and top product quality. The following aspects are measured in real time:

- Contours and sizes
- Edges
- Position of the glass ribbon
- Thickness of glass and layers
- Stresses
- Temperature
- Quality
- Surface quality

The data captured are fed back into the production process. They help spot departures from processes at an early stage and trend analyses of recurring problems reduce losses. The production process is fully transparent and full complete product analysis is possible.

For the glass line’s stacking process to work well, it relies on a good sorting process. We can develop a smart system for you so that conveying and stacking are a class act. What’s required are the right number of stackers at maximum capacity to deliver a highly accurate and scratch-free result.

Grenzebach offers best-in-class technologies to guarantee precise stacking at the end of the glass lines. Sheets of glass can be simply removed by hand or by using a fully automatic stacker for small, mid-size, large and extra-extra-large glass sheets of up to 24 meters or 26 yards and weighing up to 3 tons or 6,613 pounds.

The sheets of glass can be removed from the tin or air side, from several levels – tiers and drops, statically or picked on the fly. Single or dual pick options ensure greater efficiency. The smart combination of two stackers, which can be used singly or as a pair for extra-long sheets, allows fully flexible production.

The Grenzebach portfolio has a large variety of handling equipment, ranging from portal stackers, swing stackers, direct stackers, under-table stackers and robot technology. At the same time, a range of different combinations of handling equipment and platforms. And it’s all adapted to cope with the subsequent material flow.
Glass plays a pivotal role in delivering a healthy indoor climate in homes and workplaces. It fulfills people’s needs for interiors that are light, cozily warm or pleasantly cool. All of us encounter glass hundreds of times every day and it helps foster that feel-good factor. Producing glass is a complex process and collaborating with you to improve it is something we do with a passion.

Letting the sun in lights up an office, home or architecture. Absorbing or reflecting the sunlight away keeps interiors at a pleasant temperature. Glass controls how bright rooms are, but does much more than that, it creates an atmosphere. This aspect should be very important to us, because, after all, we spend about 80 percent of our time indoors nowadays.

Glass adds to our quality of life and standard of health, makes us feel comfortable and safe. Glass is an energy-efficient component and a practical means of protecting the climate. High-performance glass means that homes and workplaces require less heating and air conditioning.

The right product is turned into glass facades or roofs to virtually flood whole buildings with natural light but keeps heat out at the same time. Glass that offers protection from the sun isn’t just good for human beings. It also preserves the condition of furniture, floorings and works of art indoors.

These are all aspects that stem from the unbeatable performance of coatings applied in the coater. Due to their composition, the coatings are so temperature stable that the sheets of glass can be bent or turned into safety glass at high temperatures.

Glass can be energy efficient, environmentally friendly, spectacular and safe. In terms of functionality and appearance, it helps define buildings. And we provide innovative technology so that you can customize the glass in your environment to suit your requirements.
GLASS WITH ADDED VALUE

Architectural glass showcases buildings. Grenzebach’s PVD coating technology turns the raw material into an energy-efficient component. PVD large-area glass coating is a core technology that meets requirements in terms of functionality and appearance. Grenzebach provides turnkey equipment for the entire coating process and materials handling. We’re the only supplier when it comes to fully automatic and customized coater solutions that can produce thermal insulation and solar control layers on glass. And of course, service for the PVD coaters installed worldwide is part of the package. Three decades of experience mean we know coaters inside and out.

PVD stands for Physical Vapor Deposition. This is a process where laser beams, magnetically deflected ions or electrons and arc discharge vaporize the material known as the target. The result is a pure, metallic surface without any contaminants, which is a must in order for coatings to stick properly.

Urbanization is a huge trend. Glass can help make urban buildings and mobility energy efficient and smart. Coating glass is a key technology for both today’s and tomorrow’s world.

Dr. Jens Ellrich
Head of Coating Technology

Our fully automatic PVD coaters allow the production of state-of-the-art coating systems ranging from Solar Control to high-end low-e coating systems. The coaters can also apply all types of coating destined for exclusive products. Examples include dielectric (electrically insulating) materials such as Si3N4 or TiO2 to ultra-thin metal and blocker layers like Ag and NiCr all the way to special coatings for use in displays or the solar industry such as transparent, conductive layers (ITO, ZnO, ZnMgO). Our PVD systems are designed to deliver anything customers could possibly want in terms of coating.

FUTURE-PROOF LAB COATER

Our new coating lab’s main purpose is to create products for tomorrow’s world. The lab was custom built to carry out experiments and tests in order to develop and adapt glass coating technology.

The jumbo glass coater is deal for research and development and all lab application requirements. It’s one of the world’s few lab coaters that can operate on substrates that are up to 3.4 meters or approx. 11.15 foot long. The coaters can also apply all types of coating destined for exclusive products.

INTEGRATED CONTROL

An integrated control concept takes coating-line productivity and efficiency to a new level – a benchmark for all the coating and handling machinery. Interlinking production steps, as well as tracking and analyzing machine parameters, are what make needs-based maintenance and therefore longer service lives possible in the first place. We’ll liaise with you to shift to flexible maintenance and cleaning based on actual requirements. Downtime and coating costs drop while productivity rises. We generate added value for customers paired with maximum flexibility.

Glass coating technology for that functional and attractive finish.
Smart, connected and transparent processes all along the line.

INTEGRATED PRODUCTION LOGISTICS

Want to interconnect stations on the glass production line, create links from the cold end to the warehouse or from the production line to temporary storage space? As far as we’re concerned, the sky’s the limit.

The factory of the future will revolve around automation concepts that learn as they go along. Traditional conveying technology will grow to increasingly embrace modern robotics and automatic guided vehicles (AGVs), which are autonomous and boast a high level of availability. Automatic guided vehicles enable sustainable flexibility of processes. For example, our software also allows route planning of forklifts and AGVs.

Grenzebach increases efficiency by guaranteeing that the right products are in the right place at the right time.

STAYING ON TRACK WITH PRODUCT TRACEABILITY

If an item of glass in a high-rise facade needs replacing, then product traceability is invaluable. All the information and data generated along the value chain can be captured and used. The ability to associate this information with basic sheets of glass and the products these are turned into allows stakeholders in the glass ecosystem to trace the whole process, starting from the production line to the warehouse and all the way to the consumer. This is a huge asset and the foundation for continual improvement.

In future, product traceability will allow base glass manufacturers to enhance glass production because they will be able to track sheet data. During the processing stage, the data can be used to leverage more efficiency. Any product modification can be recorded and matched with batches, even batch size 1, which is increasingly popular in an era of customized production. Ultimately, facade construction businesses or automotive manufacturers also benefit because they can pick the right glass for their projects and products.

Product traceability technology is based on a product ID, which incorporates all information such as the format, production date, or production steps.

Depending on the application, the physical product is marked with one of the following technologies:

- Bar code printing
- Laser engraving, with QR codes for example
- Labeling with stickers
- RFID (Radio Frequency Identification) tagging and contactless, wireless data retrieval
A REVOLUTIONARY IMPACT ON PROCESSES

We’re offering glass manufacturers the opportunity to revolutionize their value creation processes. Industry 4.0 creates eco-systems where data-based solutions facilitate glass production in tomorrow’s world.

Digitalization can be used to retrieve a vast quantity of data and value is created by bundling and analyzing them. In the past, each of the phases in a process was treated separately in many cases, but there is significant room for improvement in applying the data across all disciplines.

Our glass customers’ key objectives are to raise product quality, increase output and improve resource efficiency.

Our technological developments and services are geared to achieving these goals in your company. We exploit the enormous potential of digitalization to boost the quality and efficiency that our equipment and automated processes have already achieved.

Using Potential Across Disciplines

Grenzebach and CNUD EFCO GFT can now cover most of the disciplines in a float glass system and their merger is a big step to reaping the rewards of Industry 4.0. Today, we can capture data on the majority of steps in the process. Actual use cases, based on the consolidation and analysis of large quantities of data, generate added value for customers and consumers.

What will the future be like?
Be a part of the journey with our digitalization solution for tomorrow’s glass production.

Digitalization has touched all areas of our lives, whether we’re using smartwatch payment options, writing a digital journal, carpooling or living in automated smart homes. Digitalization is opening the door to a spectacular future of glass production. So why not come on board?
PRACTICAL ADDED VALUE

In the field, valuable data are generated, which were previously not made use of and can now be read and processed with our SERICY’s platform’s Edge device. Edge translates the data so that they can be used by intelligent applications. Interfaces to any subordinate and overarching systems ensure openness, which is a key condition for added value in digitalization.

Our intelligent data handling allows ideal integration from the field all the way to a control system to ERP systems and our own high-level SERICY solutions with machine learning and analytics applications.

An example from the real world: A predictive maintenance app tells your team, in plenty of time, when maintenance is required. Your staff are given practical help and our systems raise the availability of your machinery even further.

Because it’s scalable, modular and configurable, SERICY can be customized and you gain a tailor-made digitalization solution.
Our new control and operating concept makes running your glass plant a breeze. To do so, the plant needs to run reliably and without any disruptions. In the process, all integrated systems can communicate in one language.

Our high-performance solution consisting of a master computer and control system can plan production, manage orders and guarantee that all processes are ones that are efficient and can be counted on.

INTUITIVE USER INTERFACES

Nevertheless, our software solutions always focus on the user. Intuitive user interfaces and intelligent navigation make life easy for everyone working on the production line.

Our operating concept delivers all the information users need. The head of production has configurable, customized dashboards to monitor and manage the production process. The shift supervisor benefits from user interfaces that allow easy order management in the control system. And operatives also have intuitive user interfaces to run the machinery. Your staff receive notifications in real time and are therefore always kept in touch. Both stationary and mobile equipment are supported, regardless of the operating system and hardware configuration.

LOWER WORKLOADS, HIGHER AVAILABILITY

The goal we share is to take the pressure off your staff as much as possible and to make certain your plant is running at peak performance and maximum availability levels.
Our mission is to maintain your production machinery at a high level of availability. We want you to benefit consistently from technological improvements and modernizations. View us as a sparring partner who offers service that goes that extra mile and ensures added value for your plant.

You need powerful technology to match your requirements. Which is why we use robot simulations to reflect all operational aspects and give you confidence that you’ve made the right investment from the get-go. We develop tailor-made solutions for you. At the same time, we discuss any issues openly, include you from the moment the development phase starts and incorporate your feedback into the design. We’ll move mountains to ensure you get the results you’re seeking.

Our technology is state of the art and we’re equally flexible when it comes to financing models. We’d be happy to find a payment plan that’s right for you too.

We focus on minimizing the risk to you and forging a good business relationship from day one.

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We live Service.
Partnership and service that go the extra mile.

It’s a privilege to oversee a customer’s operations throughout a plant’s lifecycle. Production line availability is already excellent and our team competes to see if we can do even better. And of course, we don’t hesitate to make full use of any technological improvements we identify.

Markus Gruber
Senior Vice President Business Unit Glass
Grenzebach delivers results and rock-solid dependability for the whole of your plant’s life. We can also offer tailor-made services and products as needed. During the operational phase, the after-sales team helps to make glass production happen or modernizes equipment to reflect new requirements.

**GRENZEBACH GOES THAT EXTRA MILE, ANYTIME, ANYWHERE. WE LIVE SERVICE. 24/7. WORLDWIDE.**

**DEVELOPMENT**

Innovativeness you can count on.

At Grenzebach our aspiration is to comprehensively understand your challenges during project planning to enable us to collectively reach the optimal solution. Our goal is to always meet and even exceed your technical as well as commercial expectations. The result is an excellent planning for the realization of your high-tech plant.

- Maximum benefit to customers
- Intuitive usability
- Added value generated
- Customers’ requirements fulfilled
- Advanced technologies
- Durable and future-proof solutions
- Prototype creation and testing

**PLANNING**

Trust you can count on.

At Grenzebach our aspiration is to comprehensively understand your challenges during project planning to enable us to collectively reach the optimal solution. Our goal is to always meet and even exceed your technical as well as commercial expectations. The result is an excellent planning for the realization of your high-tech plant.

- We listen, understand and act
- Personal contact
- A one-stop shop
- Customized solutions
- Requirements engineering
- Pre-planning
- Third-party equipment integrated
- Financial planning
- Cost-benefit planning
- Results on budget

**EXECUTION**

Experience you can count on.

Our joint goal is to meet the agreed production launch date. Our skilled project management team ensures your plant operates at the quality and performance level specified, on time and on budget. We can adapt to any challenges and requirements presented to us.

- Guaranteed production launch
- Professional project management
- On time and on budget
- Professional training sessions
- Performance
- Seamless handling
- Financial services
- Certification
- Safety management
- Assembly and commissioning worldwide
- Supplier management

**UTILIZATION**

Reliability you can count on.

We provide professional support and future-proof development of your plant during its entire lifecycle. This translates into less downtime, maintenance that can be scheduled and therefore, lower costs. Your dedicated and experienced service manager is on hand to provide support so you benefit from your investment to the max. As a result, you’re ready for any new market requirements or modernizations if products are discontinued.

- Peak plant availability and efficiency
- Remote technical support 24/7
- Guaranteed supply of spare parts
- Innovative upgrades
- On-site support
- Personal service manager
- Regional service worldwide

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Grenzebach uses cutting-edge technologies to respond to your requirements in today’s or tomorrow’s world. We also give you the opportunity to have an impact on a machine’s design at the developmental phase. The upshot is production technology that puts you in pole position to rise to global-market challenges. Reap the rewards of from world-class quality and output during the entire lifecycle.

Abdelfatah Shahat
Control Section Head, Sphinx Glass, Egypt
When every second of glass production counts, Grenzebach is the go-to option.

Service doesn’t just start when a problem arises, but from the moment you partner with Grenzebach. Because we know that your glass production lines never sleep. Our skilled service team will pull out all the stops to solve a problem and get your plant up and running as quickly as possible. We speak your language and are available on call in your time zone – either locally or remote.

We live Service. Our service goes that extra mile, worldwide, around the clock.

Grenzebach service to exceed expectations.

**GRENZEBACH’S SERVICE MODULES FOR THE GLASS INDUSTRY. A ONE-STOP SOLUTION.**

**ORIGINAL PARTS**
Ensure top performance, value due to durability, cut downtime.

- Excellent quality
- A one-stop shop
- Consistent production
- High levels of availability
- Quick lead times for spare parts
- Professional customer support
- Long service lives
- Supplied worldwide

**EXEMPLARY SERVICES**
Optimize technology availability, keep output constantly high, and make usage sustainable.

- 24/7 hotline
- Remote support online
- Health checks
- Preventative maintenance
- Training for customers
- On-site service
- Flexible service agreements
- Extended warranty

**ROLLING UPGRADES**
Increase output, raise plant productivity and extend lifecycle.

- Process optimization
- Plant overhaul
- Modifications to hardware and software
- Engineering consulting
- Disassembly and reassembly of machinery and parts if company relocates
- Customized, automated retrofits
- Energy saved due to new technologies and machine applications
- Plant audit and reassessment of the safety concept
- Upgrading safety components to the start of the art

**FUTURE SERVICES**
Use Grenzebach’s SERICY digitalization platform and benefit from smart, robust processes:

- AR/VR support during maintenance
- Predictive maintenance
- Electronic parts catalog
- Online documentation
- Collaboration app
- Clear reporting
- Detailed statistics
- Advanced analyses