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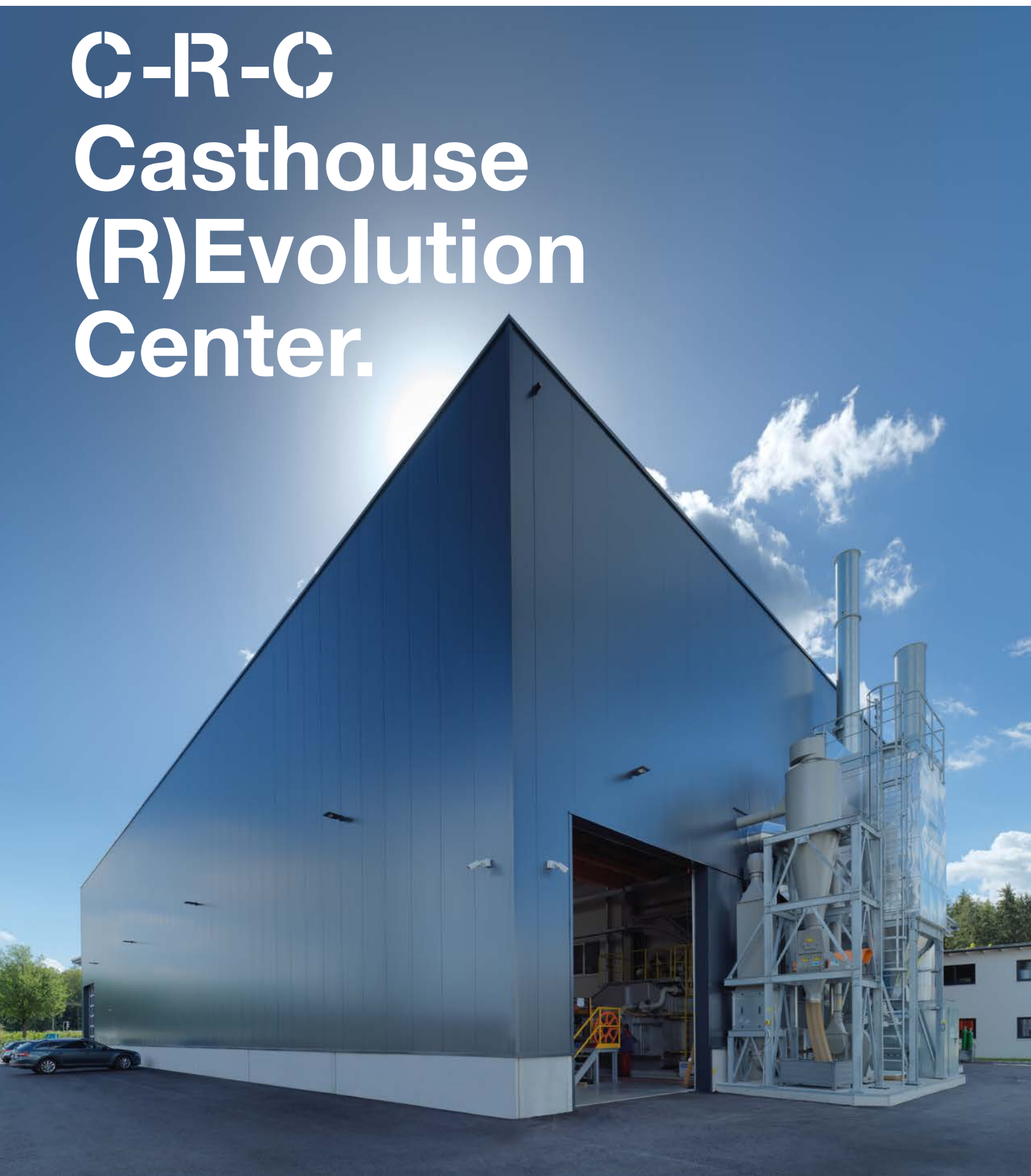
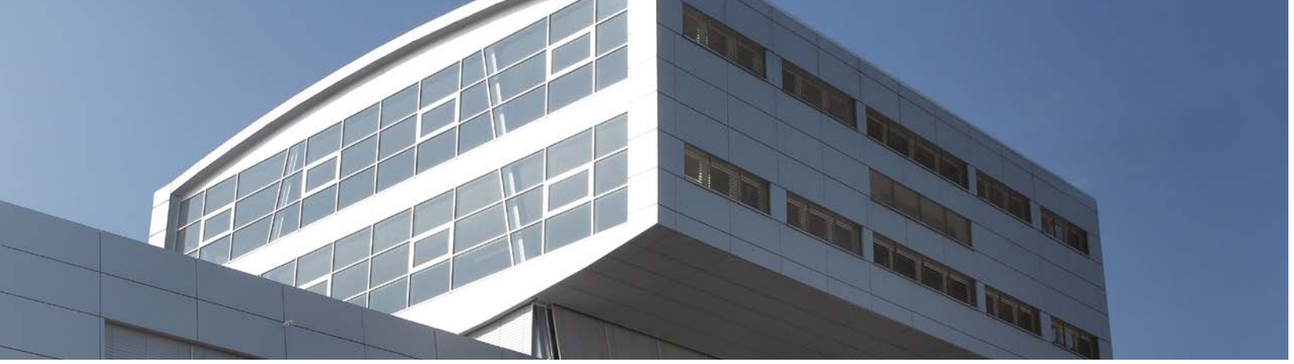
# HICON®

EBNER Group Journal for Progress in Industrial Furnace Technology

# C-R-C Casthouse (R)Evolution Center.





EBNER

**Ladies and Gentlemen,
Esteemed readers of the
HICON® Journal,
Dear friends and colleagues.**

The corona crisis has stood global business on its head, and has underlined how important it is to have an international network of strong regional subsidiaries. The **EBNER** Group has made proximity to customers one of its priorities for decades, and it is for this reason that we - despite travel restrictions - can offer local service and support.

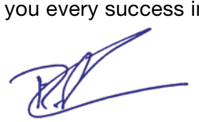
The experts at our headquarters in Linz can also be easily contacted from anywhere in the world, thanks to the possibilities offered by digital communication. Over the last few months, we have had good experience providing support through digital communication methods, and the importance of pushing forward with digitalization projects has been confirmed. In this light, I am particularly pleased to announce that our efforts in this field have recently been recognized with the Digital Leader Award 2020. You can read more about this in the article on page 6.

Many of our customers who take a long-term approach have been using the time made available by the crisis to push forward projects designed to increase efficiency and quality. This makes a great deal of sense, as large and complex facilities have lead times of one to two years. When the economy revives these companies will be well-equipped, with facilities that are state-of-the-art in terms of energy efficiency and environmental impact.

Particularly positive signals for investment have been sent by many national governments, which are attempting to dampen the shock of the economic downturn with extensive subsidies. In particular, strong support for investments in eco-friendly technologies is being offered.

**EBNER** is working intensively with go-green technologies, and can therefore advise you on many interesting and innovative aspects. More on this subject can be found in the article starting on page 4.

I hope that you enjoy this issue of the Journal, and wish you every success in these challenging times.



Yours, Robert Ebner
CEO



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# E³ EBNER Energy Efficiency.

**EBNER: a dependable partner for environmentally-friendly and energy-efficient solutions.**

**PETER GOSCH**
EBNER sustainability

**In the last issue of the HICON Journal (April, 2020), we introduced the E³ (EBNER Energy Efficiency) concept from EBNER. In this issue, we would like to tell you more about our efforts in the field of eco-friendly technologies, and call for an active dialog.**

At EBNER, we are convinced that we can best meet the ecological and economical challenges of the future when we work together with our customers and business partners.

It is for this reason that, in September of this year, we started several global campaigns aimed at reducing energy consumption and emissions - as well as at improving OEE (Overall Equipment Effectiveness) values.

With these campaigns we sought not only to inform our customers and business partners of our newest developments in these sectors: as customers and partners will be accompanying us long-term on this path, we also sought to begin a dialog with them and to work together toward a sustainable future.

The issues of energy and efficiency have come into sharp focus throughout the world, and over the course of the COVID-19 crisis many governments have developed packages of subsidies that offer particular support to initiatives in the area of eco-friendly technologies.

The Austrian federal government, for example, is subsidizing up to 14 % of the costs for investments that increase the efficiency of industrial processes, facilities or electrical technologies, and is so providing a strong incentive to invest in sustainable upgrades and modernizations.

Over and above this, the EU has set even more ambitious climate goals for achievement by 2030, and China is aiming to become climate-neutral by 2060. At EBNER, we would like to do our part to help meet these ambitious goals.

To achieve this, the experts here at EBNER have developed a variety of E³ modules:

- **Up to 20 % savings in hydrogen and electricity with ATMOSPHEREperfect.** This newly-developed software module regulates the process atmosphere purge flowrate during the heat treatment process, in response to motor current. This optimization reduces both atmosphere (hydrogen) and electrical consumption.
- **Up to a 10 % reduction in $CO_2$ emissions** through combustion air preheating. Combustion air is preheated by a recuperator, and can achieve up to 430 °C. The increased combustion air temperature increases combustion efficiency, leading to a reduction in $CO_2$ emissions.
- **Up to 50 % energy savings** through thermal energy recovery. The thermal energy of the exhaust gas is used to heat circulation water, which in turn can be used to heat workshops, facility components or water supplies.
- **Up to 70 % hydrogen savings** through process atmosphere recycling. Contaminated hydrogen is drawn out of the facility and fed into a hydrogen regeneration system, which incorporates a filter unit, an adsorber, a catalytic converter and analyzers. It is purified and then returned for re-use in processing.

The above is only a small excerpt from our E³ portfolio.

EBNER takes environmental responsibility very seriously. To be able to continue to offer the best and most innovative E³ solutions, we will continue to work on a variety of targeted approaches and solutions with our customers and partners over the coming months and years. Together, we can create a future that both conserves resources and provides success.

# CATCH.

## A new era of productivity - automated order processing along the entire supply chain.


**STEPHAN PUXKANDL**

**EBNER** news
Digitalization


**The need to permanently optimize production processes, even as product portfolios are expanded at the same time and significant investment is avoided, shapes the requirements of EBNER customers. With the goal of making our customers total cost of ownership champions, EBNER has busied itself intensively with digital solutions.**

Optimizing the OEE (Overall Equipment Effectiveness) makes facilities more economical. The latest **EBNER** technology ensures that facility availability is at its maximum, and quality is assured due to optiomal operation of the facility (in this area, the **EBNER** Academy can support the operators). To ensure full facility utilization, the idea of **CATCH** enters the picture.

### WHAT IS CATCH AND WHO IS BEHIND IT?

**CATCH** stands for **CA**pacity ma**TCH**, and is a platform to facilitate contacts that is based on a research project known as FlexProd. It is designed to support the optimization of heat treatment facility utilization throughout the supply chain. An alliance between X-Net (a software developer), the Austrian Institute of Technology and the **EBNER** Group set itself the goal of developing a platform for creating and processing industrial orders that was decentralized, and so conformed - even as it provided extreme flexibility - to the most stringent security standards.

The solution was to combine a cloud-based “dating” platform for machine production data with a matchmaking system based on the use of encrypted data, and to do so without the use of centralized data storage. The system is founded on the use of three key technologies, which have been tailored to interact with one another:

### MATCHMAKING

Both facilities and packages of services suitable for orders being placed are determined in a decentralized manner.

### MULTI-PARTY COMPUTATION

Both the buyer and seller are supported up to actual placement of an order. This takes place without the unnecessary release of data or revelation of confidential information, ensuring a safe and anonymous auction service.

### BLOCKCHAINS

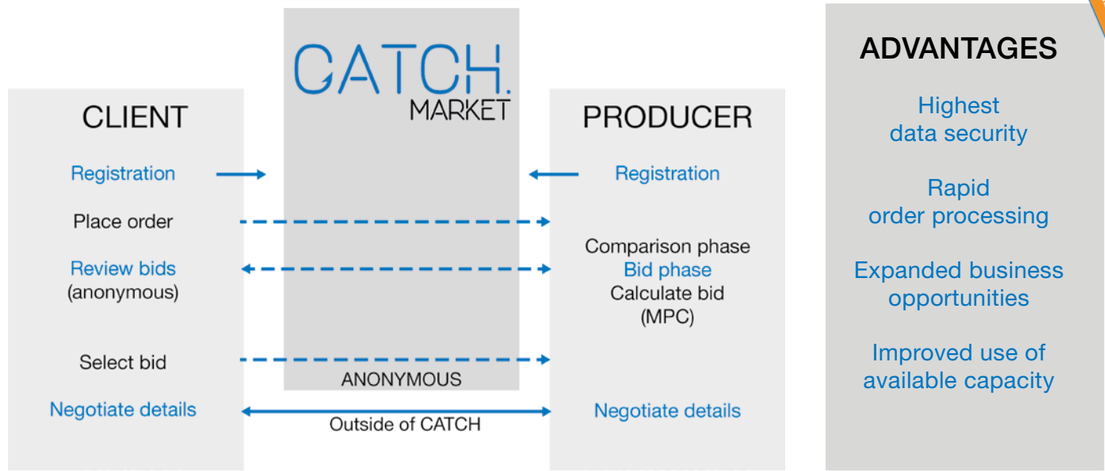
The integration of blockchain technologies ensures traceability and provides the transparency needed for acceptance of the contact and auction service.

### HOW DOES CATCH WORK?

The clever combination of digital technologies with **EBNER**’s production and market know-how makes it possible to book free production capacity in a wide range of plants throughout the world. Using **CATCH**, companies that have free manufacturing capacity can offer it anonymously to customers throughout the world. Companies requiring such capacity can request it quickly and easily, and their requests will reach every **CATCH** user. At manufacturers receiving requests, appropriate bids are automatically generated and forwarded to decision-makers for review. Within seconds, a company requesting bids is notified how many potential bidders are available in the network. Within hours, a suitable selection of bids - which include estimated shipping costs, meaning that the bids are full and complete - is available. In short, the search for suppliers,



**CATCH, the digital dating platform for machinery, was awarded 3rd place in the “Project” category at the Digital Leader Awards 2020.**




market analysis and order procurement are all processed efficiently and absolute anonymity is guaranteed. All this takes place at a speed that usual procurement processes cannot achieve.

### HOW DO USERS OF THE PLATFORM BENEFIT?

The platform offers a digital solution for optimizing the TCO (Total Cost of Ownership), in that increased utilization and the ability to react to production peaks support better use of a facility’s capacity.

Furthermore, **CATCH** enables a more efficient and more rapid processing of orders along the entire supply chain. That is, orders are processed more quickly, as the individual steps making up the process are automated wherever possible. Customer bases are expanded, and the possibility of making intelligent comparisons (matchmaking) also leads to new business opportunities. The principle of security by design has constantly been followed, an approach that fulfills the need of customers to protect their intellectual property. This is a significant aspect, when one considers the increasing amount of digitalization in industry.

### WHAT DOES A CATCH CONTACT PROCESS LOOK LIKE?

A company (client) uploads a request to the network using **CATCH**. In just a few seconds, the system locates all companies in the network that might potentially bid on the request. These bidders receive anonymous requests that are automatically processed, and appropriate bids are generated using the company’s existing calculation templates. Before these bids are released to be forwarded to the potential customer, bidders have an opportunity to review and revise their quotes. The estimated shipping costs, depending on the bidder, are also also forwarded along with the quote. This means that the costs forwarded in the bid will be extremely close to the actual costs.

The process is 100 % anonymous, as all company-relevant data are processed behind the firewalls of the respective companies. Only after the requesting company has selected a bid do the two parties enter into direct contact with one another, to conclude the contract. This last step, closing the deal, takes place outside of the **CATCH** system.

### WHEN WILL THE PLATFORM BE AVAILABLE?

In the fall of 2019, the **CATCH** Promotion Tour through India and China encountered a great deal of interest in this technology and the first interested parties and users are already on board. The goal is to have the platform go on line in 2021 with a limited number of users, the beta testers.

The beta testing phase will be used to optimize the database, so that over the course of 2021 it will become available for additional applications and product segments. The range of products throughout the supply chain will subsequently be expanded step-by-step.

**www.catch.direct**


**If you are interested or have further questions, please feel free to contact:**
Stephan Puxkandl
px@ebner.cc
+43 (732) 6868-1515


# EBNER ACADEMY.

## EBNER supports success and the development of competence at its customers with a state-of-the-art educational concept tailored to individual needs.

**CHRISTIAN KOVACS**

The EBNER Academy

**In an era of rapid technological progress, global complexity and an ever-increasing amount of digitalization, continuing education plays a significant role in industry.**

Demographic and technological change has led to increasing demands on productivity and effectiveness, which in turn must be met by fewer and fewer numbers of people.

### A NEW APPROACH TO CONTINUING EDUCATION

In the future, education will no longer take place exclusively in the form of lectures and classroom situations - forms of teaching that still dominate the current status quo in continuing education. To respond to new requirements, education must itself change. These changes will particularly affect the following areas:

» topics
» structure
» duration
» as well as in the retrievability of input.

Internationalization, individualization, integration and differentiation are not just buzzwords, but are factors crucial to survival that describe target audiences, languages, timing and content. Today's markets are dynamic, specialized and international. Industries are knowledge-intensive, and require professional expertise to ensure the thorough development of employee competencies.

### THE EBNER ACADEMY: HIGH LEVEL TRAINING

Productivity and cost efficiency are the result of influencing factors that are perfectly in tune with one another at an EBNER facility. Starting with furnace processes and energy flows, and continuing on up to maintenance and safety systems, there are numerous factors that contribute to getting the most out of an EBNER furnace. The EBNER Academy, staffed with specialists for each type of furnace, supports our customers in this effort.

Within the framework of the EBNER Academy, modern and goal-oriented curricula have been developed for the steel, aluminum and copper base metal sectors. Emphasis has been placed on the following:

» quality management
» maintenance
» energy efficiency
» safety
» operation and processing

With just-in-time seminars, workshops and training courses, our curricula can contribute to the qualification of your engineers, technicians and operators. We can offer them support in the form of open courses or in-house training in current issues and technologies, on subjects such as software, processes, automation systems and heat treatment know-how.

Courses offered by the EBNER Academy range from one-day seminars to long-term training and Web 2.0 technologies, in the form of webinars. Training is tailored to meet your needs. Together with our customers, we analyze the needs of the target audience, determine content and define the goals of the educational effort. Regardless of whether your emphasis is on steel, aluminum or copper base metals, we are in a position to provide training in maintenance, production or scheduling processes with qualification programs specially designed to meet your needs and that were developed for your company, your manufacturing team and your engineering team. Our "hybrid" courses, comprised of a mix of on-line (webinar) and live training (on site at the facility, either at our works or at our partner's works), can also greatly benefit you - particularly when installing new facilities or when introducing new processes.


### STAY ONE STEP AHEAD

The EBNER Academy supports efficiency and global competitiveness by taking into account factors crucial to business success:

» 5S - Sort, Set in Order, Shine, Standardize and Sustain
» TPM - Total Productive Maintenance
» FTQ - First Time Quality
» ROI - Return On Investment
» OEE - Overall Equipment Effectiveness
» TCO - Total Cost of Ownership

Over and above this, we focus on tailoring training and qualification procedures so precisely to the needs of participants that instruction improves both the structure of workflows and qualitative and quantitative efficiency. This means that, when all is said and done, the benefits to your company are demonstrable.

Make the **EBNER** Academy your long-term partner, accompanying you down your path in continuing education. Our common goal is the thorough and lasting development of competence.

We look forward to working with you!

## EBNER TRAINING COURSES

### LEVEL 1 - BASIC TRAINING STEEL

L1-S-001 - On-site Training - Efficient operating concept of the EBNER heat treatment furnace (1 day)

L1-S-002 - Simatic S7 Software (1 day)

L1-S-003 - Advanced course - PLS - Visual Furnace 6 (2 days)

L1-S-004 - CQI9 - Application in Theory and Practice (2 days)

L1-S-005 - AMS2750 - Application in Theory and Practice (2 days)

L1-S-006 - Basics of Heat Treatment (1 day)

L1-S-007 - Advanced Course in Heat Treatment of Steel in EBNER Furnaces (1 day)

### LEVEL 2 - ADVANCED TRAINING STEEL

L2-S-001 - Advanced Training - Tailored Part Properties in Press Hardening of Steel (1 day)

### LEVEL 1 - BASIC TRAINING ALUMINUM

L1-A-001 - On-site Training - Efficient operating concept of the EBNER heat treatment furnace (1 day)

L1-A-002 - Simatic S7 Software (1 day)

L1-A-003 - Advanced course - PLS - Visual Furnace 6 (2 days)

L1-A-004 - CQI9 - Application in Theory and Practice (2 days)

L1-A-005 - AMS2750 - Application in Theory and Practice (2 days)

L1-A-006 - Basics of Heat Treatment (1 day)

L1-A-007 - Advanced Course in Heat Treatment of Aluminum in EBNER Furnaces (1 day)

### LEVEL 2 - ADVANCED TRAINING ALUMINUM

L2-A-001 - Intensive Training - Hot Forming and Quenching of Aluminum Alloys (2 days)

### EFFICIENCY TRAINING - HICON® floater furnaces

ET-A-001 - HICON® floater furnace - General

ET-A-002 - HICON® floater furnace - System manual

ET-A-003 - HICON® floater furnace - Gas heating training

ET-A-004 - HICON® floater furnace - Trail Thermocouple Measurement on Strip

ET-A-005 - HICON® floater furnace - Lifting of the furnace roof

### LEVEL 1 - BASIC TRAINING COPPER BASE METALS

L1-C-001 - On-site Training - Efficient operating concept of the EBNER heat treatment furnace (1 day)

L1-C-002 - Simatic S7 Software (1 day)

L1-C-003 - Advanced course - PLS - Visual Furnace 6 (2 days)

L1-C-004 - CQI9 - Application in Theory and Practice (2 days)

L1-C-005 - AMS2750 - Application in Theory and Practice (2 days)

L1-C-006 - Basics of Heat Treatment (1 day)

L1-C-007 - Advanced Course in Heat Treatment of Copper Base Metals in EBNER Furnaces (1 day)


EBNER Academy

**“Learn when, where and what you want!
Sounds tempting?
We support your needs...”**

**Christian Kovacs**

## Have we sparked your interest?

**If so, please contact:**

**Christian Kovacs
ebnertrainings@ebner.cc**

**More information can be found on our website:**

**https://academy.ebnergroup.cc/en/training**

# EBNER facilities 4.0.

**Digital models, digital facility operation, virtual commissioning, digital customer service.**



**CHRISTIAN TEUREZBACHER**
**EBNER** digitalization

**In the field of digital communication, the corona crisis has revealed what and how much is really possible. Digital communication has allowed us to successfully remain networked and in close contact with our business partners across the globe.**

Many people view the current health crisis as a force driving digitalization in the industrial sector. However, as a leading, innovative company, the issue of digitalization has played an important role at **EBNER** for some time.

As was mentioned in the April issue, **EBNER**'s business strategy has been designed to serve one major goal: to make our customers Total Cost of Ownership (TCO) champions. Many factors influence the operating costs of a facility, and they can lead to massive increases when measured across the entire service life of the facility.

In turn, this means that the idea of TCO is a thread that also runs throughout the entire **EBNER** digitalization strategy, and which makes a significant contribution to the process-optimized and cost-optimized operation of facilities.

At **EBNER**, the concept of digitalization encompasses the following four areas:

» Digital models
» Digital facility operation
» Virtual commissioning
» Digital customer service

## DIGITAL MODELS – EFFICIENT PRODUCTION DESPITE A REQUIREMENT FOR FLEXIBILITY

The term digital models refers to physical and mathematical models that describe and illustrate processes in the furnace. They provide a foundation for the optimization of automatic operation of the facility. Sensors provide data on the current status, which is then used to control processes in the furnace fully automatically - based on the mathematical models. This means that the desired final properties of the material are reliably achieved. The model coordinates all processes needed for heat treatment, and so guarantees both fully automatic facility control and consistent quality.
All this means that the facility can be kept in optimal operating condition, leading to both improved product quality and improved yields.

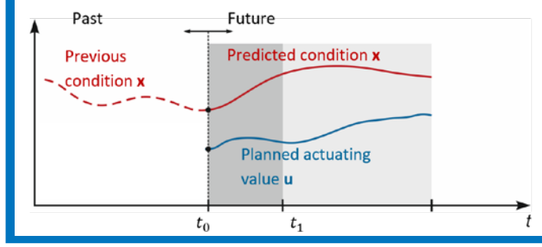
As a part of this, **EBNER** is currently working on introducing Properties Predictive Control (PPC), an extremely complex processing model integrated across the manufacturing chain.

## DIGITAL FACILITY OPERATION WITH VISUAL**FURNACES**® 8

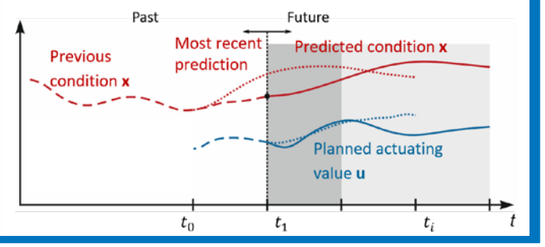
The digital model is linked to a modern control system, through which facility operators can operate the facility from their smartphones - regardless of their actual location. This supports resource-optimized facility operation. Currently, **EBNER** facilities are operated using VISUAL**FURNACES 6**. **EBNER** is developing a modernized version of this software, which will have a completely new, state-of-the-art and web-compatible interface in a responsive design. It will go on the market as VISUAL**FURNACES 8**.

### Mathematical Model Predictive Control (MPC)

Based on a mathematical model of the facility, Model Predictive Control (MPC) optimally performs calculations needed in the future and determines required inputs/actuating values.




This procedure is repeated in every time segment. Malfunctions during the process may lead to deviations between calculated and actual conditions.



## DIGITAL CUSTOMER SERVICE – myEBNER

A survey of **EBNER** customers on the topics of service and digital services, carried out in 2019, showed that customer needs are evolving: they are moving from preventative maintenance to predictive maintenance. Thanks to modern sensing technologies, required service tasks will able to be identified much more precisely in the future. This means savings for customers, as well as the certainty that only parts really requiring replacement are replaced.

In addition, **EBNER** is working on a digital spare parts catalog that will enable spare parts to be electronically procured quickly and easily.

All facility information that is important to the customer (drawings, spare part lists, training handbooks, etc.) will be available through a digital platform tailored to customer needs, **myEBNER**. Information on technical innovations and potential upgrades will also be made available, and service tickets can be both requested and tracked.

## VIRTUAL COMMISSIONING - DIGITAL TWIN

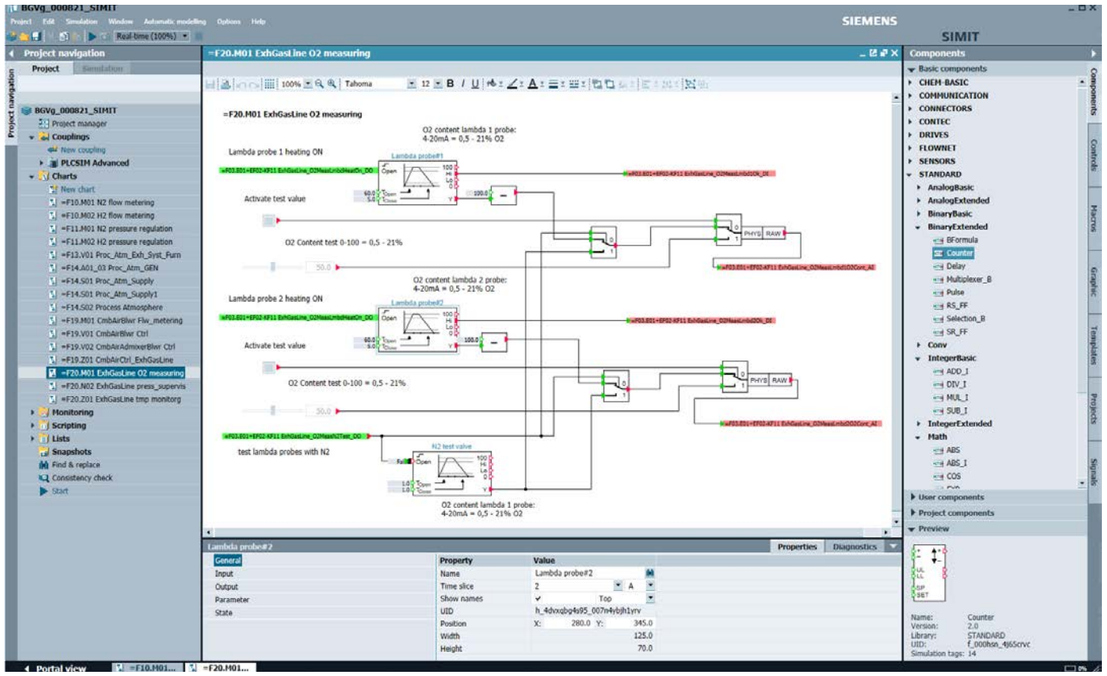
The term digital twin refers to a detailed, digital image of a furnace. Both the mechanical sequences, which are based on 3D models, and process-related sequences are depicted and a fully-functional 3D digital model of the facility is created. With the aid of this digital twin, facility operations can be simulated using the process models described above and the facility can be run through commissioning procedures while still in the design phase. This allows problems, which must otherwise be detected on site, to be located and resolved in advance. Alterations to processes can also be tested before they are uploaded to the actual physical facility.

Virtual commissioning saves costs, and increases the reliability of commissioning. The time commissioning engineers are deployed is minimized, and travel time is optimized. This allows the prices quoted in bids to be calculated even more finely. In addition to all the above, virtual training can be offered. **EBNER** virtual commissioning will be available for initial types of facility starting in 2021.

**EBNER**´s digitalization strategy is centered on the idea of TCO, with the aim of optimizing operating costs, increasing productivity and increasing energy efficiency - along with continuous improvement and development.

As a final note, significant factors in a successful implementation are close cooperation and the exchange of information with a customer, enabling the precise adaptation of digitalized solutions to their needs in a future-oriented manner.

The SIMIT software package for virtual commissioning




# A quantum leap forward in the hardening and tempering market.

**Thanks to continuous innovation, the throughput capacity of EBNER hardening and tempering lines has doubled over the years.**





**KARL WOHLFART**

**EBNER** news
from Germany

**SASCHA EPPENSTEINER**

**EBNER** news
from Germany

**About a year ago, C.D. Waelzholz GmbH & Co. KG of Hagen, Germany successfully started production with the world's most powerful hardening and tempering line - manufactured by EBNER.**

Founded in 1829, Waelzholz today is an innovative and internationally-active family-owned company employing cutting-edge technology, with branches on four continents. Over 2400 employees throughout the world manufacture tailor-made steel strip and profiles not just in Europe, but in China, North America and South America as well.

## A LEADER IN THE HARDENING AND TEMPERING SECTOR

Cooperation between the Waelzholz Group and EBNER began in 1985, with the successful commissioning of their first EBNER hardening and tempering line for steel strip. This line was designed to martemper carbon steel strip with a width of up to 650 mm and a thickness of up to 4.0 mm.

In the following years, additional EBNER lines for various Waelzholz works in Germany and Brazil were commissioned. Since then, seven EBNER hardening & tempering lines designed to produce carbon steel strip with martensitic, bainitic or sorbitic microstructures have gone into operation.

## THE CONCEPT BEHIND THE NEWEST HARDENING AND TEMPERING LINE

The new hardening and tempering line for steel strip, currently the most powerful line in the world, has been producing high-quality carbon steel since 2019. It is distinguished by the following features:

» A highly-flexible austenitizing furnace with a roller transport system guarantees short times when switching between temperatures, as well as the lowest possible exhaust gas emissions due to the use of a special strip heating system.

» The high capacity molten metal quench is equipped with automatic level control for the molten metal, as well as a thermal energy management system.

» The martensite cooling section supports a wide range of product types and ensures a high degree of reproducibility.

» The tempering section, with a leveling furnace that can be precisely adjusted and a HICON® tempering furnace equipped with a jet nozzle system, provides a high level of uniformity and ensures that quick changes can be made in the processing conditions.

» The high degree of automation, with pre-setting func-

Inlet section with welder and pinch roll stand

tions and weld seam tracking integrated into the processing steps, ensures that high productivity is paired with low personnel requirements.

## THE GENERAL CONTRACTOR

**EBNER** acted as the general contractor when supplying the facility. This began with development of the concept for the complete facility (strip handling section, heat treatment section, automation systems) and continued on up to implementation, including installation and commissioning.

## COMPARING THE GENERATIONS

The following comparison between the first and latest facilities supplied to Waelzholz underlines the high degree of innovation that has taken place at **EBNER** throughout the years:

» Increase of the maximum throughput capacity by abt. 100 %

» Reduction of the specific fuel gas consumption by abt. 30 %

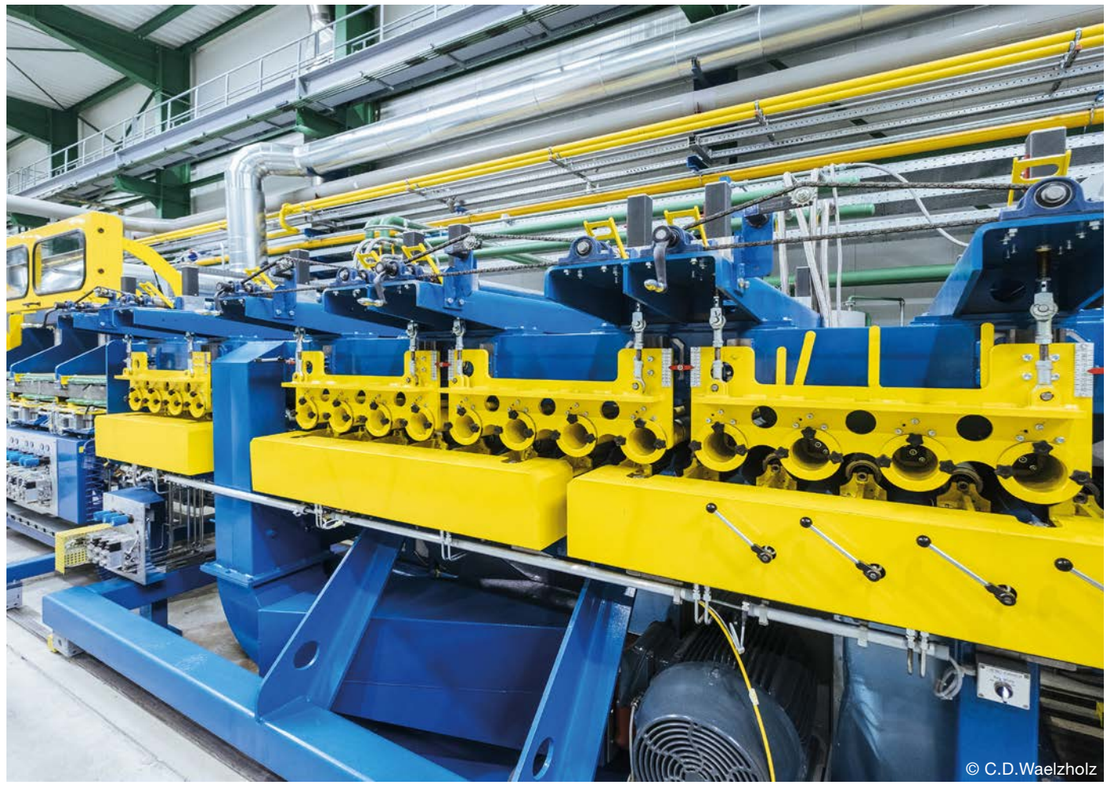
» Increase of the maximum strip cross section by abt. 30 %

We hope that the high capacity and long service lives of our facilities will continue to contribute to the global success of C.D. Waelzholz.

www.waelzholz.com

| TECHNICAL DATA OF FACILITY: | |
|---|---|
| Hardening and tempering technology | Martempering |
| Materials | Non-alloyed and low-alloy carbon steels |
| Strip width | 150 - 750 mm |
| Strip thickness | 0.5 - 5 mm |
| Number of strands | 1 - 3 |

Martensite cooling section



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© C.D.Waelzholz

# C-R-C Casthouse (R)Evolution Center.

## HPI and Gautschi “mold” a new future for casting technology in Ranshofen, Austria




**ROBERT SCHMIDT**

**Gautschi** news
from Austria

**RAINER EDTMEIER**

**HPI** news
from Austria

**For almost 100 years, Gautschi Engineering GmbH has been a driving force in raising casthouse equipment technologies to new levels. HPI - High Performance Industrietechnik GmbH specializes in the horizontal continuous casting of light metals, and in recent years the company has demonstrated its pioneering role through continuous development.**

With the establishment of a state-of-the-art technology center in Ranshofen, Austria, the two companies have taken another step forward in extending their technological lead.

The Casthouse (R)Evolution Center (**C-R-C**) in Ranshofen, Austria is a full-scale industrial foundry, offering a horizontal casting facility operated by HPI and a vertical casting facility operated by Gautschi. Both facilities are available from October 2020 for customer demonstrations, alloy trials, operator training, and small, quick and/or special production runs. The facilities will also be used to further develop the state-of-the-art molds and casting systems of both companies, including all related aspects such as safety, quality, metal yield, and productivity.

A variety of equipment is available from HPI, including a 1.5 t electric melting furnace, a rod feeder device for grain refinement and of course the heart of the facility: a horizontal continuous casting machine (HSG) with flying saw. The entire production process, from melting the base material to production of first-class semi-finished aluminum products in both round and rectangular formats, is offered.

In addition to all this, the technology center is equipped with a 7.5 t melting furnace from Gautschi. When required, this furnace can supply the HPI casting line with liquid metal for an extended period of time. The Gautschi vertical casting machine is capable of casting slabs and billets in any alloy and up to 6.5 m in length. Material is fed in from the Gautschi melting furnace mentioned above. An inline degasser and a ceramic filter guarantee top quality.

Gautschi has been a supplier of casting machines for both billets and slabs for many years, and offers several types of molds on the market. These include the well-known Gautschi billet mold, which has demonstrated its advanced quality and performance at many locations

7.5 t melting furnace from Gautschi

over the last 20 years, and the recently-developed and newly-introduced Gautschi slab mold. The new Gautschi slab mold was developed by an international team comprised of casting experts and experienced Gautschi design engineers. Making use of their extensive experience in casting difficult and highly-demanding alloys, including slabs used in aircraft and automotive body applications, the experts focused on providing real 100 % hands-free casting, significantly less scalping scrap and significantly less butt curl for all alloys, even as they ensured that the strictest safety standards were maintained in the manufacturing process. In light of their experience, the team of experts expects that the new Gautschi slab mold will have a definite impact on, as well as meet, the highest demands currently placed by the market - as well as those expected in the future.

The Gautschi billet mold is based on the Air Glide technology developed by VAW. An excellent surface, a low segregation zone, high pit recovery and easy maintenance have made this mold a huge success. The full range of alloys has been cast successfully with Gautschi billet molds, including the most demanding aircraft alloys. This billet mold has been improved over the last few years, and will be further improved at the CRC by making use of the pilot caster.

The complete process is connected to a data logging and analysis system, enabling continuous data recording and process evaluation throughout the entire plant. By recording and analyzing the properties of the semi-finished product, such as the microstructure, surface quality, tensile strength and hardness, parameter effects can be derived and precise prediction models generated. These models allow a direct derivation of the effects of process conditions on the quality and properties of the end product. The prerequisites for qualitative and quantitative optimization of the customer's production are thus given. The affiliated laboratory enables detailed evaluation and analysis of the metallurgical properties of a product. In addition to a spectrometer for measuring the chemical composition, the lab also includes a thermal analysis facility to determine the solidification behavior of the alloy and a device to record the hydrogen content in the melt. Small crucible and heat treatment furnaces round out the available equipment in order to, for example, reproduce small melts (a few kilograms), homogenization tests and aging tests.

The unique features of the technology center promote and support creative processes in the field of mechanical engineering. In cooperation with foundry specialists, new geometries and casting systems can be built in the affiliated mold workshop and tested directly at the lines. The knowledge gained flows directly back into the design.

Thanks to the new technology center, customers are always at the cutting edge of technology - benefiting from the bundled know-how in Ranshofen, the center of the aluminum industry in Austria.

**ww.c-r-c.info**
**www.hpi.cc**
**www.gautschi.cc**

1.5 t electric melting furnace from HPI





# Years of experience and expertise.

## Gautschi's painstaking developmental work and the high value of its experience lead to the award of an order for a new pit-type furnace.

**OLIVER JANSEN**

**Gautschi** news
from the USA

**Aleris Lewisport of Kentucky, USA recently placed an order with Gautschi for a new pit-type furnace for aluminum rolling slabs after an extensive pre-engineering phase at both companies.**

The furnace will be installed in an existing pit, and meets the highest standards for energy consumption, emission parameters and accuracy of homogenization in the product. The furnace is planned to start operation at the end of 2021.

Over the past seven years, Gautschi has sold eight pit-type furnaces to customers throughout the world, with capacities up to 550 t for single-chamber furnaces and up to 940 t for dual-chamber furnaces.

### WHAT ARE THE SECRETS TO SUCCESS BEHIND THIS ACHIEVEMENT?

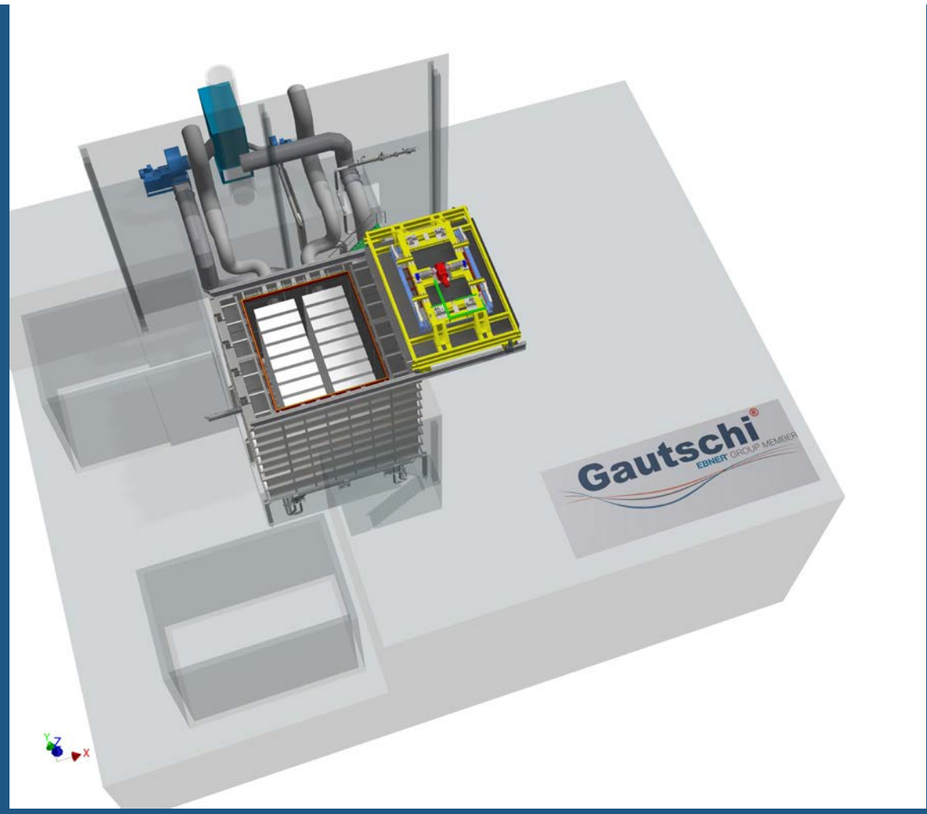
» The high degree of flexibility in the constructive design makes it possible to adapt the furnace to individual space requirements at customer plants. At the same time, the capacity required by the customer is ensured and their productivity is increased.

» Continuous technological development, paired with improvements to air flow and temperature uniformity, guarantees a process that does not lead to hot spots or exert other negative influences on the slabs.

» The latest generation of regenerative burner systems, a process control system employing operator-friendly mobile technology, and the many well-thought-out features contributing to the function of the facility round out this investment by bringing our customers many benefits - including reduced homogenizing times, reduced energy consumption, a high throughput, the highest possible equipment availability and a long service life.

**www.aleris.com**


Pit-type furnace to preheat rolling slabs




Layout of a typical pit-type furnace

# China and the corona crisis.

## Recovery of the special steel wire industry after the corona crisis.



**JIASHENG WANG**

**EBNER** news
from China

**At the beginning of 2020, China was the first to be hit by the coronavirus. After several months of strict prevention and control measures that attracted worldwide attention such as city lockdowns, district lockdowns and village lockdowns, as well as a war-like campaign to fight the virus calling for a coordinated effort by the whole nation, the domestic pandemic has been effectively controlled and China's huge manufacturing industry has gradually recovered.**

China's automobile industry has grown rapidly over the past decade, and the machinery manufacturing industry has become highly sophisticated. As one of their supporting industries, the special steel wire industry was one of the earliest to recover after the pandemic. The **EBNER** Group recently received two important orders, both from private enterprises in the economically-active Yangtze River Delta region.

In recent years, the **EBNER** Group has implemented a double-brand approach for some products on the Chinese market. This allows us to meet the needs of customers at all levels, as well as the multi-level demands of middle and high-end customers in different situations.

The **EBNER** brand series of products represents the world-class level of technology and equipment that is shared across all major markets around the world. It serves high-end customers that have extreme requirements on quality, performance and automation, and who are not as sensitive about the initial investment needed to meet their advanced requirements.

Based on **EBNER** technology, the **EED** brand series of products represents a commitment to provide China-class technology and equipment through the best combination of localization and foreign advanced technologies. Key components are manufactured through a manufacturing platform shared with **EBNER** China. **EED** customers are those medium and high-end players who pursue practical solutions, where the highest price/performance ratio is paired with a reasonable initial investment.

| CHANGZHOU KAIMING | |
|---|---|
| Brand | EBNER |
| Furnace type | gas-fired bell annealer |
| Scope | 3 workbases, 2 heating bells, 1 cooling bell |
| Material | GCr15, hot-rolled wire without oxide skin |
| Heat treatment process | spheroidization anneal |
| Annual capacity | 35,278 t |
| **JIANGSU SHENYUAN** | |
| Brand | EED |
| Furnace type | gas-fired bell annealer |
| Scope | 3 workbases, 2 heating bells, 1 cooling bell |
| Material | 5Cr9Si3, 4Cr9Si2,5Cr8Si2, 4Cr10Si2Mo, X85, stainless |
| Heat treatment process | soft anneal |
| Annual capacity | 119,600 t |

The **EBNER** Group's products always serve those middle and high-end customers who have high requirements regarding product quality, production efficiency, operational safety and Total Cost of Ownership (TCO) in the global market. It is realized that medium and high-end customers also have cost pressures with diversified and multi-level needs, due to the diversity of requirements from their downstream customers. The multi-brand strategy provides a good solution for our customers.

In the past three years, **EBNER** bell-type annealing furnaces for special steel wire have been favored by Mascometal, Xingcheng Special Steel, SeAH and Changzhou Kaiming; **EED** bell-type annealing furnaces for special steel wire have been selected by Nanjing Nangang Shenghua, Xingcheng Special Steel, Shijiazhuang Steel and Jiangsu Shenyuan. These companies are manufacturers of high-end fasteners or auto parts suppliers, and all of them play leading roles in their industrial sectors.

The Chinese government promotes healthy and sustainable development in the manufacturing industry. As the key raw material for the automobile industry and the advanced equipment manufacturing industry, special steel wire – the quality of which is directly determined by heat treatment - greatly influences advancement in these subsequent industries. The **EBNER** Group is optimistic about the development of the Chinese market in this sector.

Manufacturing at the **EBNER** workshop in Taicang

Bell annealer facility at Nanjing Nangang Shenhua

# Flexible. Solution-oriented. Customer-oriented.

**EBNER finds the right solutions for its customers, even in difficult times.**



**HERBERT GABRIEL**

**EBNER** news
from the USA

**In 2019, Steel Dynamics Incorporated announced the construction of a greenfield EAF sheet mill in Sinton, Texas.**

SDI is an impressive American success story. Since they began operations in Indiana in 1996, they have quickly become one of the largest and most successful steel companies. Once the Sinton mill is operational, SDI will have an annual capacity of nearly 15 million tons. **EBNER** is proud to have been part of SDI's story since the very beginning, and we are very excited about the fact that we can once again supply a **HICON/$H_2$®** batch annealing facility, made in the USA. With a coil stacking height of 260 inches, SDI will be operating the tallest facility of its kind in North America.

**EBNER** Furnaces in Ohio has been busy manufacturing the twelve-base facility, and despite some COVID 19-related adversity has maintained a schedule that dovetails nicely with the progress on-site. The $1.9 billion Sinton project is obviously a massive job site, and earlier this year **EBNER** and SDI began discussions regarding how the installation progress could be optimized - even as costs and risks were reduced at the same time.

## THE EBNER SOLUTION

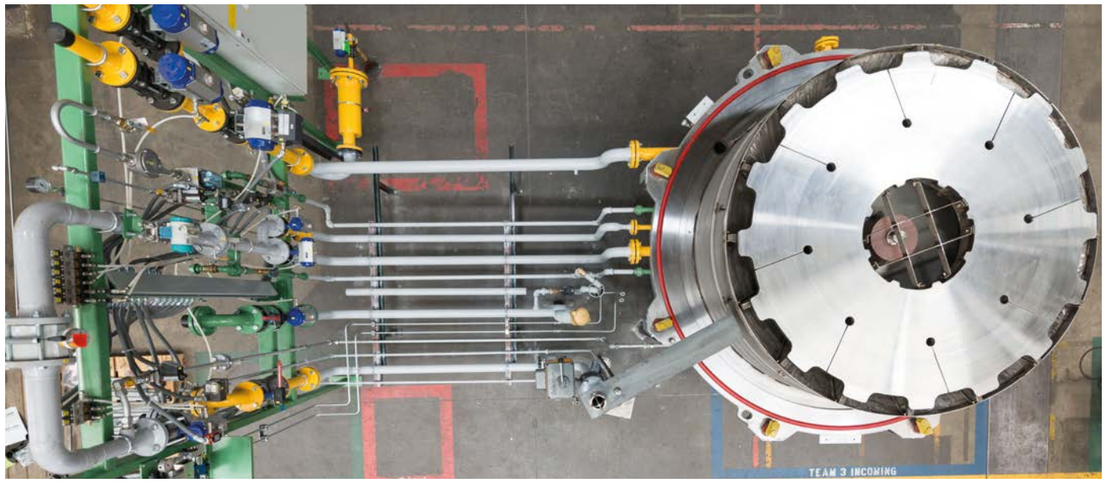
The answer was to pre-assemble the equipment prior to shipment, to an extent never accomplished before. This entailed a mock-up installation in **EBNER**'s workshop in Ohio. Almost all interconnecting pipe runs were manufactured, match-marked and shipped as pre-built units, ready for quick bolt-on connection on site. As a result, field work - especially field welds - could be avoided to a large extent. In addition to the pre-fabricated pipework, the pre-assembly of individual facility components was carried out to a far greater degree than usual. A large portion of the assembly work traditionally done in the field was shifted to the **EBNER** workshop. This was made possible by 3D designs, where the level of detail in **EBNER**'s engineering became essential. Working to exacting dimensions with a high degree of accuracy is an absolute must to ensure a proper fit and fast installation on site. Thanks to **EBNER**'s ingenuity and flexibility, we were able to complete the tasks in the workshop successfully and on time, and by the time this article goes to print the on-site work will be well on its way.

The minimal final site assembly requirements reduce potential installation conflicts at a time when buildings and cranes are going up seemingly everywhere, reduces peak resource need and increases site safety. Due to work already performed ahead of time, **EBNER** is able to reduce site work for a faster and more efficient installation and at reduced overall project costs.

We would like to thank to SDI team for trusting us not only with the design and manufacturing of the equipment, but also for collaborating with us on pre-site preparations and during the installation.

www.steeldynamics.com

Completed pipe runs



# A glimpse behind the scenes.

## Thanks to process optimization, EBNER USA has improved both efficiency and quality - providing customers with added value.

**HERBERT GABRIEL**

**EBNER** news
from the USA

**As a part of our internal effort to optimize processes and workflows, a new paint booth was installed at EBNER Furnaces in the USA. You can learn more about this installation and the background behind it in the following interview.**

**HICON® Journal: Could you please explain what led to the decision to install a paint booth?**

Late in 2017, we started looking into the possibility of adding on to the workshop. In that process, we determined that adding a paint booth would not only optimize our floor space, but also improve our workflow. In the end, we figured out that just adding the paint booth to our current layout was enough to free up the much-needed floor space we were after.

Without a paint booth, we would spread parts out onto the floor and paint them one side at a time. This was an extremely inefficient process that could take days, if not weeks, depending on the drying time - which depends on humidity. By adding the booth, we can now process those same parts that took several days to cure in a matter of hours.

**HICON® Journal: How did you decide on the size?**

Initially, we didn't decide on the exact size that we needed. Instead, we conducted several process flow exercises throughout the entire workshop to gain a better understanding of where the booth should actually be in our workflow. Once the optimal spot was determined, we wanted to maximize the available space in that area. In doing so we ended up with a booth at 22' x 30' and a height of 14'. This will accommodate basically all but the largest furnace components and piping systems.

**HICON® Journal: Can you summarize the features of the booth?**

We ended up going with a custom-designed booth, in order to accommodate our larger components. Two of the main custom features are the oversized doorways. Standard paint booth product doors are located on the short side of the booth. However, we moved the product doors to the long side of the booth, which allowed for a 12' x 22' doorway. These oversized folding doors also open up towards a main shipping aisle, with overhead crane capacity for loading and unloading trucks. On the opposite side of the booth, we designed for a double-man door which opens up into a newly-designed Quality Control / Shipping area. This will optimize our workflow for finished goods. Our booth incorporates heated replacement air, which allows for minimum painting temperatures of 70 °F throughout the year. Additionally, our booth features low temperature curing at 160 °F for accelerated curing times.

**HICON® Journal: How about environmental concerns?**

The design and operation of the booth were approved by both the county and the EPA (Environmental Protection Agency). From an environmental standpoint, we are making significant improvements to our past painting process. The booth is designed to contain hazardous gases and materials which would otherwise be released into the environment.

**HICON® Journal: What kind of improvements are you expecting from the booth?**

Painting within a controlled environment will certainly improve our quality. No longer will we will have to contend with dust and debris settling onto finished products. The curing option will not only improve the durability of our paint, but it will also reduce our throughput times, thus creating additional floor space within the production areas. However, the biggest improvement I see with the booth is the safety of our employees. Harmful vapors and gases will now be contained and filtered within the booth which will improve the air quality for our workforce.

**HICON® Journal:** Thank you very much for the interesting conversation and explanations!

**www.ebnerfurnaces.com**

Paint booth in the workshop at **EBNER** USA

# Convinced by EBNER quality.

## The Indian automotive and bicycle industries rely on steels heat treated by EBNER.

CHERUKUPALLI NAGABHUSHANAM

EBNER news
from India

**Avon Ispat & Power Limited, based in Ludhiana, India, specializes in manufacturing cold-rolled strip for bicycles, rims and car parts. The company is one of the Indian bicycle industry's largest suppliers, and has set new standards in the quality of raw materials and production equipment.**

Avon and EBNER have enjoyed a successful partnership for over seven years. During this period of time, AVON has repeatedly placed orders with EBNER for HICON/$H_2$® bell annealer facilities, since AVON values the excellent price/performance ratio.

When Avon's directors visited the workshop at EBNER Linz, they were impressed with the latest development - the EBNER HICON/$H_2$Q® CAL - as well as with the in-house full-scale R&D lab.

Following the visit, Avon decided to order Asia's first EBNER HICON/$H_2$Q® CAL (High Convection Hydrogen Quench Continuous Annealing Line) for producing AHSS & UHSS grades for the automotive industry. This equipment has already successfully started production at Avon's works in Ludhiana, India. Avon is convinced that they are now in a better position to meet the special demands of the ever-growing domestic, as well as the international, market.

The HICON/$H_2$Q® continuous annealing line (CAL) from EBNER, with its state-of-the-art quench, can process AHSS & UHSS grades from 580 - 1700 MPa yield strength with incomparable flatness. The hydrogen quench is a revolution in precisely controlled cooling. Incredibly high cooling gradients in excess of 200 K/s.mm, plus the ability to interrupt quenching and then control the temperature at a technologically advantageous level, ensure that our customers achieve the highest throughputs, precise cooling across the entire strip profile, width and length, excellent flatness and the cleanest surface finish. There are unique quench settings for UHSS/AHSS, as well as next generation AHSS for light weighting applications.

The project saw excellent cooperation between the EBNER sales team, our subsidiary EBNER India, the EBNER R&D department and the Avon team, and EBNER would like to thank Avon for placing their trust in us once again.

www.avonispat.com



EBNER HICON $H_2$Q® continuous annealing line

Volume 31. Issue 02. / November, 2020. www.ebnergroup.cc UNBW 10106583

# NEWS

HICON® Journal is also available by email!

## Trade fairs. Conventions. 2020/2021

| | | | | | |
|---|---|---|---|---|---|
| DEC. 7 - 11, 2020 | **WIRE DÜSSELDORF** | Düsseldorf | **DE** | **ATTENDANCE CANCELED** | |
| MAY 15 - 20, 2021 | **ALUMINIUM DÜSSELDORF** | Düsseldorf | **DE** | Booth No. | **TBA** |
| JULY 7 - 9, 2021 | **ALUMINIUM 2021** | Shanghai | **CN** | Booth No. | **TBA** |

**We look forward to seeing you there!**

**To protect our employees and customers, we have canceled our plans to attend WIRE Düsseldorf 2020. Making plans to attend a trade fair has become difficult, due to the covid-19 crisis. It is for this reason that we have created the EBNER ACADEMY. Through live webinars and training sessions, the EBNER ACADEMY can keep you informed of new product developments and keep you up to date on EBNER technologies.**
**Visit https://academy.ebnergroup.cc/en/live-webinar to sign up now!**

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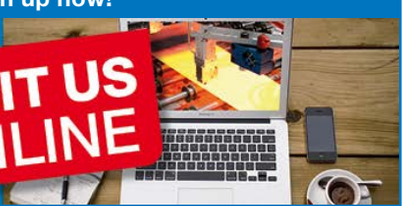

**We would also welcome your visit to any of our company locations, where you can gather personal impressions of our technologies and the opportunities they offer.**

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