

JOURNAL

Economic plants for autoclaved aerated concrete blocks and panels, fibre cement sheets, quicklime and dry mortar

EDITION 2017

TOPICS



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125 years Wehrhahn – serving customers around the globe

In 1892, 125 years ago, Heinrich Wehrhahn established the company Wehrhahn in Delmenhorst. This year Wehrhahn is proudly celebrating its 125th anniversary, still as a family owned business with strong roots.

Standing still has never been an option for Wehrhahn. Listen carefully to our customers and to identify their needs has always been important for us. The company's philosophy is and has always been to become better every day.

Since the early days, the company has been focusing on machines and plants for the building material industry. Initially clay brick factories, excavators, and saw milling equipment were in the portfolio of supplies.

Years later two direction giving developments still affect our today's business:

1936 – Fibre cement

The new competitively priced composite material fibre cement conquered the markets. Wehrhahn built plants for the cost-effective production of fibre cement roofing, flat sheets and fibre cement pipes, thus establishing the global reputation the company still enjoys to this day as a leading supplier of machines and technologies.

1970 – AAC

Increasing energy awareness created a demand for well-insulating, lightweight wall building materials. Autoclaved aerated



Dr. Klaus Bohnemann

"Our confidence in AAC, this lightweight and versatile wall building material has been the decisive base for the today's success."

concrete (AAC) gained growing market acceptance around the globe. Wehrhahn absorbed this need and developed plants for the production of AAC blocks and panels. Starting with low capacity plants with little automation, Wehrhahn gradually developed fully automated high-performance plants for AAC precision blocks and panels with a daily output of up to 2,000 m³ – 50 to 80 road trains per day – enough for 20 to 50 homes.



Dipl.-Ing. Torsten Dietz

"We are very happy that our anniversary comes along with 'all new' machines and plant concepts launched in 2017 for AAC and fibre cement sheet production plants."

Today

Wehrhahn is recognised as leading solution provider for the AAC (autoclaved aerated

concrete) and fibre cement sheet production industries. More than 200 references around the globe prove Wehrhahn's proficiency in this sector.

What makes Wehrhahn plants and technologies attractive for investors in all parts of the world? Our customers cite various characteristics, such as: latest innovative features, extraordinary reliability and competent services always quickly available. We call it "best value for money".



Dipl.-Ing. Armin Berndt

"Our highly qualified team and the excellent economic situation of the company are our assets. Wehrhahn is well prepared and organised for the future."

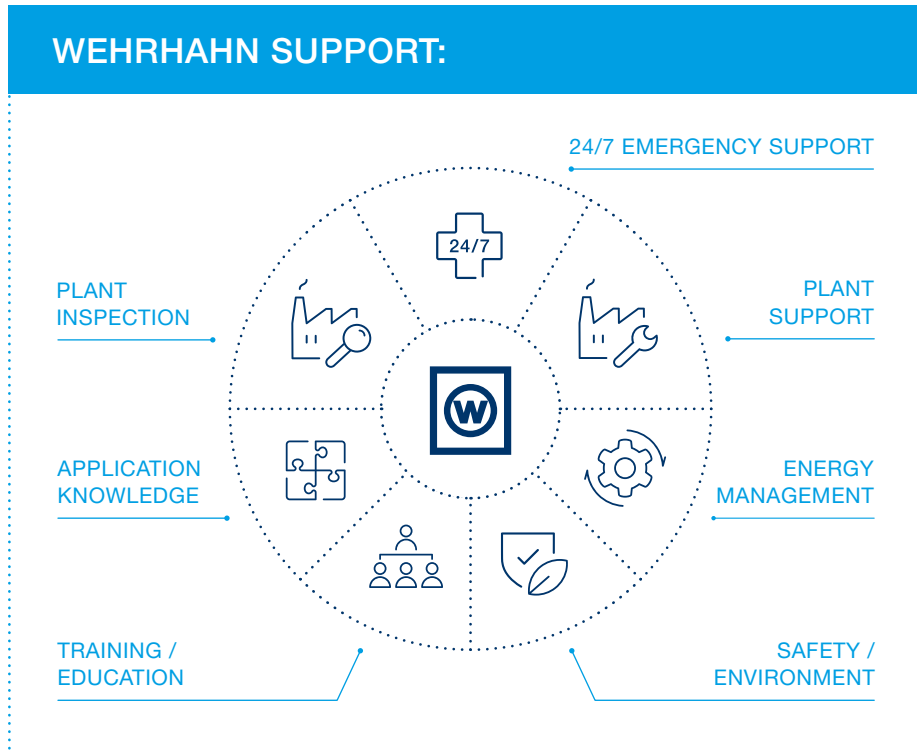
Tomorrow

It is our intention to continue writing the company's story of success. All of us are aware that the drive to become better every day paired with curiosity and courage for new challenges are most important for us.

We thank you, our customers, for your loyalty over many years and your valuable input which helps us to remain innovative. Be assured that our customers will always take centre stage in our activities!



Are you certain your plant is running most efficiently?



Talking to producers from all over the world it is obvious that most of them explore similar questions:

- How can I increase plant capacity?
- Is there any chance to cut production costs?
- Is the production plant running optimal?
- Are there any measures to optimise the production process?

Besides satisfying the highest demands for quality, feasibility and reliability Wehrhahn is not simply a plant supplier. Wehrhahn will also come in as a reliable and experienced service partner to assist customers

and building material producers all over the world.

Recognised as the innovator in the industry, Wehrhahn developed various support concepts to meet today's production challenges. The experience gained in more than 200 supplied production plants results in valuable knowledge and a unique network which our customers may benefit from. The offered modules of support feature: plant inspection, plant support, energy management, process optimisation – there are even more comprehensive support modules at your disposal.

Wehrhahn provides outstanding solutions, covering the most common challenges whilst the plant is running

Curious? Please contact: support@wehrhahn.de

Boost your profits! The Wehrhahn plant support

Klaus Boderke, Senior Manager Support, just returned from a successful overseas support. Time for a summary.

What does "Wehrhahn Support" mean Mr. Boderke?

"The Wehrhahn Support team consists of highly experienced specialists in plant operation. Aim is to assist customers to operate their plants in the most efficient way and to facilitate smooth plant conditions. We train the plant personnel on the job by providing intelligent solutions and make best use of the outstanding features in Wehrhahn plants. Plant inspection evalu-

ates the technical status of the machines and plant engineering. Energy management achieves sustainable reduction of energy consumption, whilst safety / environment consider the work safety and environmental issues. Training and education is essential for the staff at new and already established production sites. An additional very powerful tool is the 'Emergency Support'. Here we provide immediate assistance '24/7' whenever our customers face unforeseen difficulties."

Who asks for the Wehrhahn Support? How long are you usually staying with the customers?

"Customers on all continents with completely different plant conditions have requirements for improvements. Sometimes I stayed for two weeks, sometimes for two months."

What have you been working on?

"My tasks range from raw material optimisation and modifications of mix formulae, adjustments of machine settings, improvements of autoclave processes including energy saving, reduction of rejects up to the improvement of plant logistics. Numerous environmental and safety assessments have been done so far. Local training of the customer's staff members was an essential issue each time."

How can the benefits for the customers be evaluated?

"In one case we managed to reduce the annual production costs by approx. 1 million Euro. I spent three months at this plant. Similar results have been obtained in other cases. The plant owners were all

very satisfied because the expenses for the Wehrhahn Support amortised within a very short period of time."

Is the Wehrhahn Support simply a "one-man-show"?

"It is no one-man-show. I am the figurehead of the Wehrhahn Support, but I am surrounded by a Wehrhahn team. I am constantly in contact with my colleagues in the back office, who are on hand with help and advice. They supply information and documentation when needed. In addition, we render training for our customers at the Wehrhahn headquarter. Our conference rooms are equipped with the necessary electronic tools including simulation programs. Here the training participants can concentrate on the training without being interrupted by the day-to-day business."



Dipl.-Ing. Klaus Boderke,
Senior Manager Support

Almost 30 years of experience in AAC production. Worldwide plant support expert, quality and output increase, cost reduction, change and project management, safety and environmental assessments, profound skillness in staff training and leadership.

Know-how and experience for most feasible plant operation



Clients listen carefully to gain valuable know-how from Klaus Boderke

“All new” superSMART for H+H UK Ltd

It took almost three years for the project teams of H+H UK Ltd and Wehrhahn to mutually develop a highly sophisticated “all new” concept for this exceptional plant. Many new and innovative features will be incorporated in this project. The new factory will enable H+H UK Ltd to maintain and strengthen their leading position in the AAC market in the U.K.

In 2018 H+H UK Ltd will start the production of fly ash based blocks in the most advanced AAC plant around the globe – a new milestone in the history of H+H UK Ltd and Wehrhahn!

What makes this new plant extraordinarily efficient?

1. Utilisation of factory space

In comparison to other plant concepts, here we could reduce the required factory space by almost 30 %.

2. Significant savings for the foundations

Unbelievable but true, almost 90 % of all foundation pits have been eliminated!

3. Hydraulics

Hydraulic components could be reduced by 60 % and have been replaced by electromechanical devices.

4. Cutting line

An all new and highly sophisticated cutting line has been designed. The uniform distribution of cutting wires in a very long cutting machine reduces stress applied on the cake during cutting of thin blocks and panels. Therefore, the thickness cutter length has almost been

doubled. Wires and knives are automatically cleaned to enhance the cutting surface and to prevent material sticking to the wires.

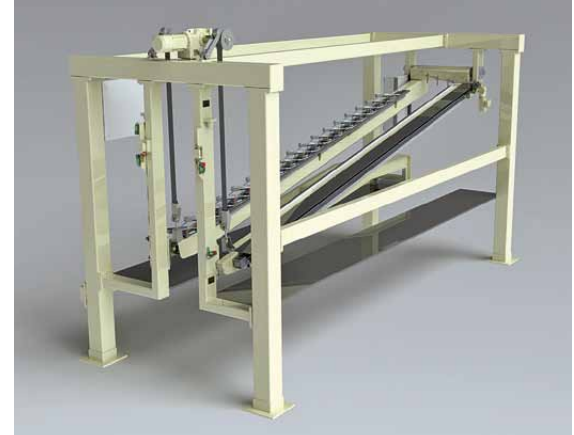
The side trimmer (cutting length and profiling) comes with a new design for “quick-change” cutting knives and automatic knife cleaning devices.

5. Process

The plant uses green cake separating technology as in many other Wehrhahn plants. A brand new curing station between cutting and green cake separating allows the cake to harden prior to separating. This reduces the risk of causing marks on the blocks and provides more flexibility for the hardness of the cake during cutting.

All machines are in-depth tested in the workshops prior to shipment. **Jochen Auffarth the Wehrhahn Project Manager** says: “We do not want to experience any surprises on site during commissioning. This is the reason why we jointly decided with H+H UK Ltd to increase the extent of the tests carried out in the workshops significantly”.

This has already been recognised by **Ed Surman (Production Director at H+H UK Ltd)**: “Things seem to be progressing well and I have been getting very positive feedback from the Borough Green team relating to the cooperation and support provided by Wehrhahn. It was very encouraging to finally see some of the machinery being put through its stress testing. Our team was extremely impressed with what they saw and are very positive about the outcome of the tests.”



Newly designed thickness cutter: high precision and stress free cutting

Highlights of the new AAC plant generation

- minus 30 % factory space needed
- minus 90 % foundation pits
- minus 60 % hydraulic components
- uniform cutting wire distribution for all formats
- quick-change system for all cutting knives
- intermediate curing: flexible timing between cutting and tilting / separating



Signing ceremony at Borough Green – first row: Torsten Dietz, Managing Partner of Wehrhahn and Calum Forsyth, Managing Director of H+H UK Ltd. Second row (left to right): Ed Surman, Gary Thwaites (H+H UK Ltd), Frank Pottin, Jochen Auffarth, Peter Daschner (Wehrhahn), Robert Wilson (H+H UK Ltd)



In-depth testing of all machines prior to shipment



H+H UK Ltd is a leading supplier of AAC in Europe



How to meet the rising demand for AAC panels



Final check for the panels with super smooth surfaces

For decades the German Wehrhahn customer Emsländer Baustoffwerke has been producing high quality AAC blocks only. Now, the block production plant was converted into a universal plant for the production of blocks and reinforced panels.

The unique Wehrhahn super smooth cutter was installed into the existing cutting line at

the Emsländer plant. The newly produced tilt-up wall panels with super smooth surface became a real success. In order to cope with the higher demand for tilt-up wall panels with super smooth surface the production capacity in unloading and packing needed to be increased. Again Wehrhahn's ingenuity was required in order to provide a tailor made solution for an automatic packing plant for tilt-up wall panels.

Based on very specific demands Wehrhahn supplied a new fully automatic unloading and packing plant covering all required production steps:

- inserting the autoclaved stacks of super smooth wall panels
- panel separating and turning by 90° to allow in all-around quality control
- fast transport to the panel stacker
- placing onto wooden pallets
- securing the pack by automatic strapping
- automatic stretch film packing
- collecting station for further transport by forklift

One by one the panels are passing the quality check position and if required panels can be moved aside for further check or finishing.

This fully automatic plant section requires only one operator just for the quality check. The result for the panel production line: **double capacity** and reduction of manpower **from four to only one operator**.

Wehrhahn automation specialists also implemented a **unique new pre-pack commissioning system**. The exact number of panels required for 1 room or for 1 apartment is packed and marked accordingly. Builders like this system as it minimises the transport of panels on the building site. It is easy and fast to apply and avoids residues. Again a tailor-made solution for the success of a Wehrhahn customer.

Indonesia: Vertical wall panels



High quality panels are now available in Indonesia

Broco is the leading AAC supplier in Indonesia and already operates a Wehrhahn PLUS plant and has recently started its second big AAC superSMART plant in Jakarta.

Like in many other markets, there is a growing demand for easy to install vertically applied wall panels in Indonesia. Broco recognised the trend immediately and decided to implement additional equipment supplied by Wehrhahn for panel production.

The idea is to mainly focus on thin panels of 75 and 100 mm thickness of up to 3 m length. These panels are used for exterior and interior walls. 100 mm fulfill structural requirements and are sufficiently insulating for the warm South East Asian climate.

Specially designed simple transport equipment enables easy panel installation without crane on site.

Russia: Advanced lintel production



Poritep lintels (from Ryasan plant)

Poritep / Eko-Zoloprodukt, the biggest AAC producer in Russia, has expanded their Ryasan ecoPLUS plant into 100 % panel and lintel production.

AAC lintels are a "must" in bitter cold areas in Russia where U-blocks with concrete filling do not sufficiently insulate.

Wehrhahn has developed for Poritep an innovative cutting system to produce 2 lintels on top of each other. All six sides are cut in green condition. This is a unique feature

and avoids any processing of the autoclaved "white" material.

Additionally there are newly designed fixing pins for fast and easy fixing of reinforcement and fully automatic unlocking prior to removing the fixing pins.

Wehrhahn's advanced new technology operates successfully even if short length lintels are produced with up to 120 lintels or 210 fixing pins per 6 x 1.2 m mould.

Successful in Malaysia: The AAC story of Stärken continues



The Malaysian AAC producer Stärken belongs to the Chin Hin Group, which is the largest building materials distributor in Malaysia.

Suppliers want to raise prices but customers want lower prices – traders are often squeezed inbetween. The Stärken group decided therefore to become a one-stop building material solution provider and invested in 2011 in AAC machinery and equipment from Wehrhahn – the start of an outstanding success story.

The Stärken AAC factory in Serendah, Selangor, produces high end AAC quality products and has already reached the maximum production plant capacity of 1,250 m³/day. Wei Luen Ng (GM of Stärken) stated – “**AAC made on Wehrhahn machinery and equipment has reached a high acceptance within the Malaysian construction market and has become a positive profit driver for the whole Chin Hin Group**”.

Stärken will expand the AAC business. The second Wehrhahn superSMART plant is currently under construction in Johor near Singapore. Parallel, the capacity of the first plant will be increased to approx. 2,000 m³/day. Now the third Wehrhahn plant is under consideration. Negotiations have started – the Stärken success story will continue!

Chinese trust in Wehrhahn technology

For almost 15 years Wehrhahn has successfully been approaching the Chinese market. The totally installed production capacity of all Wehrhahn AAC plants exceeds 3.5 million m³ per year. This is an exceptional story of success!

In China suppliers of superior European machines can only be successful if they offer “best value for money” and comply with the local expectations regarding services. Our customers expect latest technology with no compromises. Wehrhahn plants and technologies are considered to be “proven in China” which is the key argument for Chinese investors and basis for further sales.

New projects:

Baopeng from Jiangsu purchased a superSMART block and panel production plant. The plant has already demonstrated its capability and produces high-quality AAC blocks and panels.

Jing Neng Power, a daughter company of Beijing Energy, a large utility supplier, purchased a 600,000 m³ superSMART. The plant is currently under design and machines will be supplied within 2017.



50 mm thick panels: perfectly packed for the domestic and export market



Shortly after start-up, the superSMART at Baopeng is already running at full capacity

Third plant in Turkmenistan

Beyik Bina in Ashgabat, a major Turkmenistan construction group, invested into two Wehrhahn production lines for building materials.

Beyik Bina's Wehrhahn dry mix plant successfully operates already for some time.

The Wehrhahn AAC SMART production plant has recently started operation.

First step is block production, however the plant is fully designed and equipped for panel production. Beyik Bina – a very innovative group – is enthusiastic that panels are the ideal material for prefab homes. Beyik Bina will use their AAC panels for huge multi-home housing projects.

Fast and economical home building is a key issue in countries with rapidly growing population.

This project will be the first large scale panel production in Central Asia possibly to be adapted in neighbouring countries.



Fibre cement sheets are in high demand



“All new” 5-vat high performance sheeting machine

Fibre cement sheets are in high demand in many parts of the world.

Wehrhahn has currently a number of new projects in house. Together with a carefully planned production process, fibre cement sheets make it possible to develop strong and long lasting construction.

Today fibre cement is considered as a material physically suited for construction products such as cladding and roofing. It is primarily due to its function, performance and commercial value.

From around the world

Sri Lanka / El Toro:

Wehrhahn supplied a state-of-the-art plant for the production of autoclaved flat sheets. The plant has come with a large number of newly designed features. The plant started production recently and is the first plant for autoclaved fibre cement sheets in the region. Some weeks ago Tony Cooke, one of the most officially recognised fibre cement consultants in the world, visited the newly installed plant. He saw new features which he never saw in other plants before. Tony Cooke said:



“I may say that it was a pleasure to work with the Wehrhahn team, they are very professional and easy to work with. The Wehrhahn CCA installation is one of best that I have seen and it is working well.”

El Toro ordered a plant for corrugated roofing sheets. Even before the new Wehrhahn plant for flat autoclaved sheets started operation, El Toro ordered a new line for corrugated non-asbestos sheets. The plant features several innovations in the sheeting machine and cutting plant sections. The plant is scheduled to be supplied in 2018. This project is another milestone for El Toro as it will be the first plant for non-asbestos corrugated roofing sheets in the region. With these two new plants El Toro is recognised as the market and technology leader in Sri Lanka. Wehrhahn and El Toro are planning to cooperate closely in more new projects to come.

China:

ESSE from Beijing ordered two high capacity Wehrhahn flat sheet production lines for air-cured boards. Intention is to use a newly developed cement which offers many advantages in comparison to standard Portland cement.

Russia:

Kazbek from Chechnya ordered a plant for the combined production of flat and corrugated sheets. The flat sheets will be autoclaved whilst corrugated sheets are produced using air-curing technology. Wehrhahn supplies a finishing plant together with sheet production. The finishing plant enhances the sheet quality which will generate higher sales prices for Kazbek.

Tony Cooke: www.fibrementconsulting.com

35 years experience in building products industries including in fibre cement and wood cement composites

New plant features

Our aim is to secure the leading global position in plants and technologies for state-of-the-art fibre cement sheet production plants.

Some of the latest developed and already supplied features:

Sheeting machine (the heart of the plant):

- Optimised vat geometry for better slurry flow around the sieves and consequently better pick-up. Completely new is the “internal overflow recirculation” (patent is pending) which improves filtration on the sieves and is exclusively available with Wehrhahn plants.
- The layer-breaker is now operated by servo-drive and a special electronic timer synchronised with the forming roller. The new system reacts faster and is very reliable independent of the felt speed.
- All new, long lasting and easy to replace vat agitator sealing.

Mixing

- High accuracy batching: The new batchers come with an automatic calibration system to facilitate constant high accuracy during batching.

Electric control

- Automatic sheet thickness control: a newly developed algorithm evaluates the density signal from the homogenizer in the automatic sheet thickness control system. Your benefit: faster reaction of the system and easier process control.

Global Fibre Cement Conference 2017 in China: IIBCC – International Inorganic-Bonded Fiber Composites Conference

Almost 300 delegates from all over the world came to Fuzhou to listen to the latest developments and to share knowledge in fibre cement sheet production technology.

Wehrhahn was a sponsor of the conference and held a presentation covering the following important issues:

- development of new fibre cement sheet production technologies for air-cured and autoclaved sheets
- correct application of air-cured and autoclaved sheets
- production cost comparison for air-cured and autoclaved sheets
- milestones in Wehrhahn fibre cement sheet technology since 1934

A copy of the presentation is available upon request. Please contact: mail@wehrhahn.de

The next IIBCC will take place in Capetown in October 2018. <https://www.iibcc.biz>

Easy. Speedy. Economical. Universal use of AAC panels

Panels and lintels

New Wehrhahn technology for lintel production

Lintels made of AAC offer advantages in comparison with U-blocks which have to be filled with concrete on site. The wall consists only of AAC (monolithic construction) which prevents possible cold bridges and stress.

In the past the production of lintels was considered as rather complicated and cost intensive. Here the newly developed technology offers advantages for the investors.

The new concept is to produce two sets of lintels on top of each other and to cut and

separate them during cutting before autoclaving. Separating the cured lintels after autoclaving is no longer required.

Automatic reinforcement manufacturing process

The reinforcement for lintels and load-bearing panels requires clean and rust-free steel as it has to be coated prior to putting it into the mould. The reinforcement manufacture (and assembly) should therefore preferably be carried out in the AAC production plant.

Wehrhahn machines for mat and cage welding with different degree of automation are ideal to meet the individual requirements of every customer. Starting from simple mat welding machines up to fully automated solu-

tions from the coil up to the finished cage. Functional assembly places and automatic coating plants for the reinforcement complement the Wehrhahn scope of supplies.

Universal use of AAC panels

An impression of the various global applications:

Non-structural thin panels for no crane installation

have only light reinforcement for transportation and can be handled by one or two men.

Vertical walls

Mostly 100 mm (4 in) thick floor high as

external and internal walls commonly used in cost-sensitive countries with moderate climate.

These panels are extremely suitable for fast building of standardised homes.

Structural load-bearing “crane” panels

are quite popular as lintels in different lengths to cover openings like doors, windows and are a must in extremely cold climates.

- **Wall panels** of any thickness as vertical walls for home buildings, schools, hotels, motels, hospitals (mostly light reinforcement).
- **Horizontal panels** for industrial and commercial buildings where good in-house climate and fire protection are a must.



One single man can handle and install „tilt-up“ panels easily



Vertically applied load-bearing wall panels: fast and easy to install



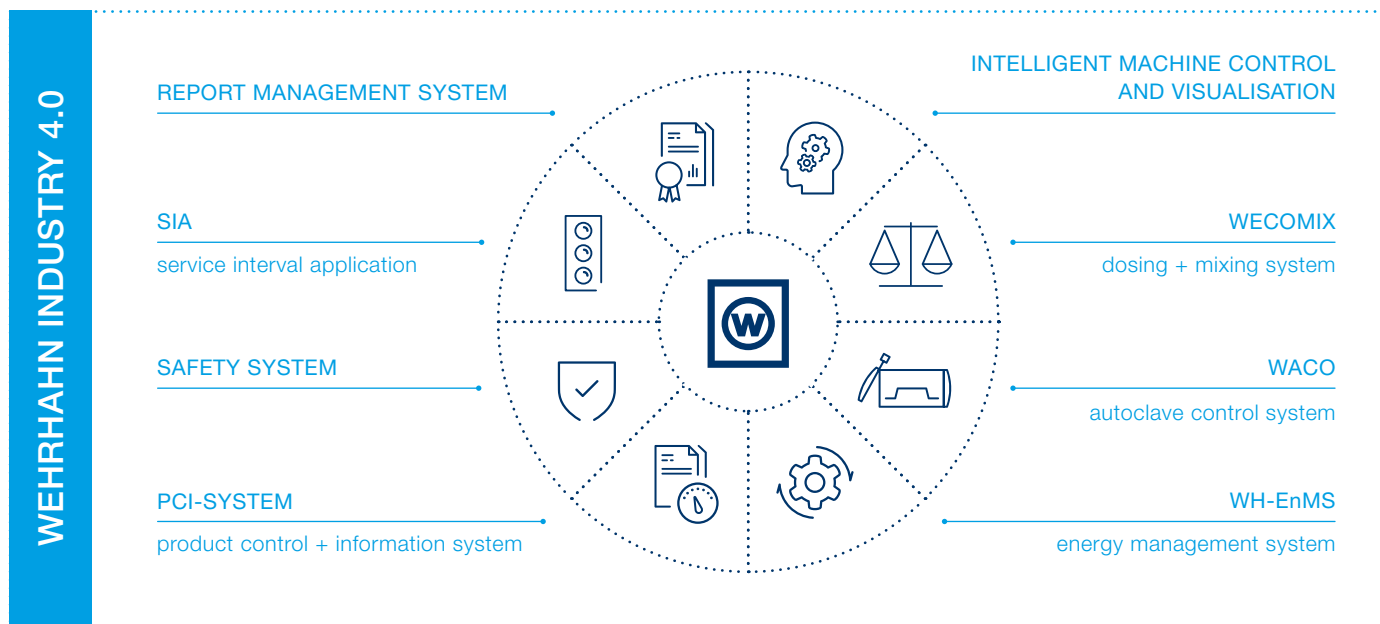
Feasible: non-structural thin panels for no-crane installation



Structural wall panels: for good in-house climate and fire protection



Wehrhahn plants feature INDUSTRY 4.0



All data of mixing can be viewed online. The consumption of raw materials for each mixture can be displayed graphically, including an overview of current and past mixing results.

3. WH-EnMS (Wehrhahn energy management system)

This system is a powerful tool which records energy data and can be used to analyse and reduce energy consumption. The obtained data can be utilised to optimise processes, identify maintenance requirements and indicate service intervals.

4. PCI (Wehrhahn product control and information system)

The useful tool to adjust machine parameters automatically when changing the product.

In 2017 the Wehrhahn MES-system has been upgraded to the "NEXT" level. "OEE-Overall Equipment Effectiveness", means additional continuous monitoring of the plant availability, plant performance and efficiency of the production process.

In the last Wehrhahn Journal 2016 we introduced some INDUSTRY 4.0 modules which are already included in Wehrhahn production plants. Here we like to share with you some further features:

MES (manufacturing execution system) is a process-related production management

system directly connected to various levels of the process automation. MES is a multi-tiered overall system which interconnects data from plant control and business management. MES allows control, monitoring and optimisation of the production in real time.

Wehrhahn engineers have integrated the following data levels to a MES overall system:

1. Commissioned order processing

A merchandise management system transfers the customer orders batchwise to the production control, automatically processed and confirmed.

2. WECOMIX (Wehrhahn control system for dosing and mixing)

Lime production – a wide range of qualities

Lime is almost everywhere. We meet lime in many different conditions in our environment and definitely in many construction materials, e.g. in AAC and drymix products.

Hard burnt lime for the production of AAC, soft and medium burnt lime for metallurgical industry, hydrated lime for the production of dry mortars, crushed stone and limestone flour (GCC) for agriculture, chemical industry, road construction. There are even far more applications.

Wehrhahn offers turnkey lime processing plants – starting at the limestone quarry, through limestone crushing, limestone burning, lumps of lime crushing or milling to powder, further to slaking into lime hydrate or even into nano-fine PCC (Precipitated Calcium Carbonate) powder.

High quality AAC production requires reliable and consistent supply of hard burnt quicklime. The ideal lime for AAC has a slaking time of 4 - 12 min. up to 60°C.

Lime which complies with the required specification is often not available near a production facility. As a consequence more and more AAC producers add a lime kiln near to their AAC production plant to have a reliable source of suitable quicklime.

The ideal lime for metallurgical industry requires a completely different specifica-

tion than for AAC production. It has to be "soft burnt" and comes with a size around 40 mm and shortest slaking times.

Due to the special shaft kiln design, even small size lime stones of > 25 mm can economically be burnt. This improves the viability of the lime stone quarry considerably, but even undersize or lower quality lime stone can be crushed or finely ground for many applications.

Wehrhahn has orders to build and supply several turnkey lime production plants for clients in Russia. The capacities range from 100 to 600 t/day of finely ground quicklime and hydrated lime with extension to produce PCC.

Shaft kilns supplied by Wehrhahn come with precisely controlled burning process by adjustable burning lances as well as by the

exact quantity of air and fuel. The technology is optimal for the production of uniformly burnt high quality lime.

Burnt lime cushioning and grinding

The production of AAC, silica brick and other products requires finely ground lime. Wehrhahn offers complete grinding systems including roller mills which are well-known for effective lime grinding and storage.



Single shaft kiln at a turn key lime production plant in Azerbaijan
Single shaft kilns with adjustable burner lances allow a precisely controlled burning process at temperatures of 900 up to 1,400 °C, ideal for soft, medium and hard burnt lime

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Wehrhahn GmbH

Muehlenstrasse 15
27753 Delmenhorst
Germany

Tel. +49 4221 12 71 0

Fax +49 4221 12 71 80

mail@wehrhahn.de

www.wehrhahn.de