

JOURNAL

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

EDITION 2016

TOPICS



Mechanical and electrical design perfectly combined

Already many years ago Wehrhahn recognized the importance of the close cooperation between the mechanical and electrical engineers.

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Stunning new features in fibre cement sheet production

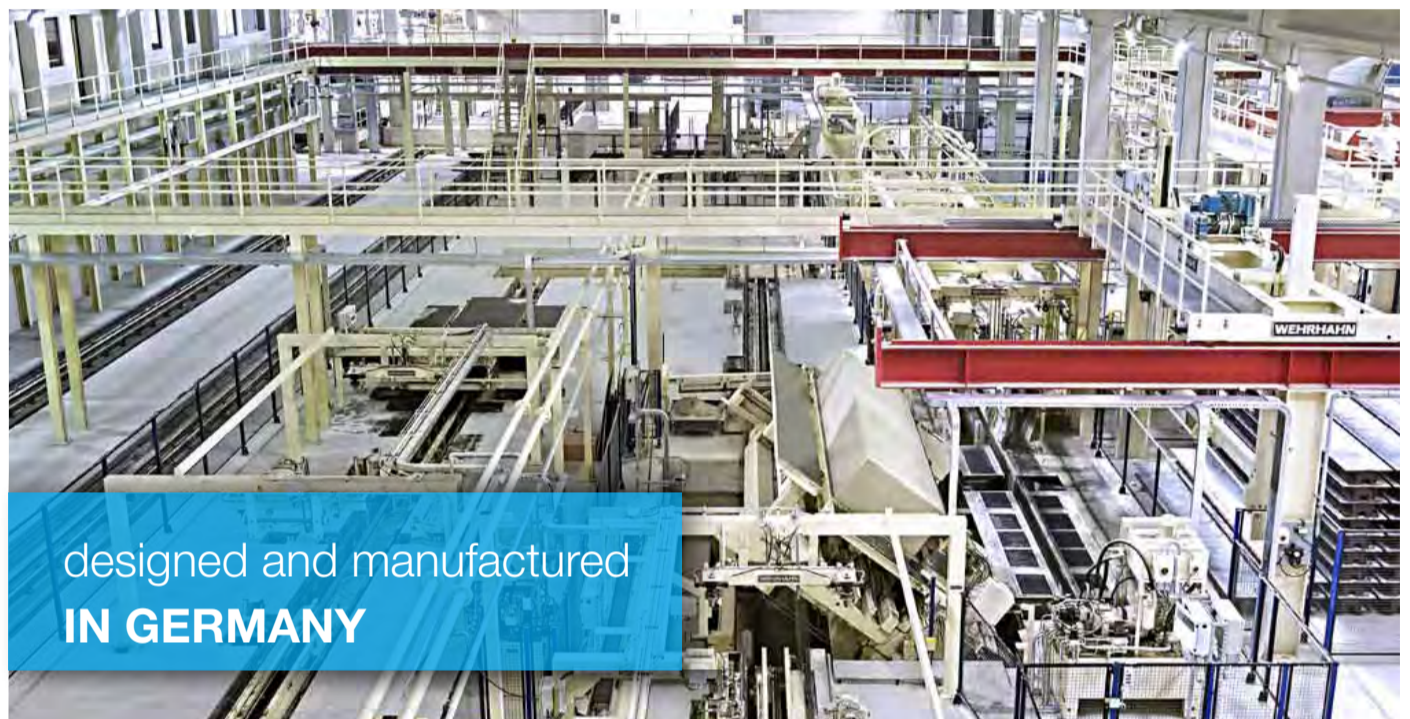
The latest generation of fibre cement production plants comes with intelligent new features

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New technology for lintel production

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.

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designed and manufactured
IN GERMANY

Investment in German Technology?

Many investors are convinced about the competitive advantages of Wehrhahn production plants. It is matter of fact that the initial investment for quality production plants is higher than for low-cost and low quality alternatives, but finally the investment in “quality” and “innovation” pays back. What makes Wehrhahn plants special and superior to others?

The assessment of several statements from owners of Wehrhahn plants provides us with a clear picture:

• **Highest level of qualified final products and lowest possible production costs:**

Thanks to constant innovative solutions Wehrhahn plants set the benchmark in the market when it comes to the highest level of qualified final products. The combination of precision, gentle handling of the building materials and fully automated processes are an asset for every investor.

• **Plant concepts for each demand:** Different requirements need different solutions. Wehrhahn offers a wide variety of plant concepts which are individually fine-tuned to meet all specific requests. We consider us as a “Solution Provider” rather than a simple machine supplier.

• **Plant availability:** Wehrhahn machines are designed to facilitate continuous production without interruptions. The perfect design and the usage of selected quality

components for hydraulics, electric components, sensors, etc. allows buyers to reach highest possible availability figures and lowest possible maintenance costs of their plants.

• **Exceptional tolerances:** Building materials, efficiently produced on Wehrhahn plants meet and exceed most internationally applicable standards.

• **Reduced production costs:** Wehrhahn processes have been optimized over many years based on the valuable experience gained in more than 200 projects around the globe. The consumption of raw materials, energy and manpower has continuously been reduced and set the standard in the industry.

• **Integrated intelligent systems:** Such as “energy management” and “process control and information” systems assist buyers to facilitate a stable and most efficient production. The latest generation of plants comes with **new features like:**

• **service interval indicator:** the control system checks continuously the condition of each single machine and informs the operators concerning maintenance demand. This reduces the risk of production stops and allows the management to implement preventative maintenance procedures.

• **Maintenance plan:** The maintenance plan is conveniently online available at operator panels. Searching for the paper version is no longer needed.

• **Extended services:** Our service concept has significantly been upgraded in the past years. Besides the after sales services Wehrhahn offers assistance in the preparation of business plans, in marketing, provides financing concepts and support in application of the final products. Investors benefit from our ultimately global network of customers and specialists.



Upgrade your product portfolio – interesting trends in the construction industry

With more than 120 AAC production plant projects worldwide in the last 30 years Wehrhahn has become the global leader in supplying machinery, complete plants and technical solutions to customers all over the world.

Beside the ongoing development of new AAC production technology, Wehrhahn has also gained a great knowledge of individual

country-specific construction solutions. Wehrhahn was a welcome partner, who assisted in the development of individual building solutions. Wehrhahn is proud to share some of the latest developments and is gladly available to support your product portfolio upgrade – contact Wehrhahn and we will share more construction trends.

Here some examples:

NON LOADBEARING PANELS (U.S. MARKET AREA)

3" (7.5 cm) AAC panels are used as external wall cladding to steel frames or wood sticks or as floor slabs. The panels and slabs are very competitive. Easy and fast to install. The construction market is enthusiastic about perfect insulation as well as highest fire protection.



PREFABRICATED AAC WALL ELEMENTS

(soon available in the Asian market area)

A reinforced AAC panel is the base for any kind of wall design. Each construction site will benefit from a fast and safe installation of already prefabricated and even prewired and finished AAC wall panel solutions.



AAC FIRE PANELS – EXCEED THE REQUIREMENTS OF THE STANDARD BUILDING CODE IN THE U.S. MARKET

Construction teams are using AAC as lightweight, high-performance concrete fire-wall assemblies and have carved a niche in the U.S. construction market. AAC firewalls are close to become standard by which all high-performance firewalls are measured. AAC combines the advantages of non-combustible concrete with the workability of wood. AAC is an affordable “upgrade” from gypsum wall construction.



DECORATION BLOCK (ASIAN MARKET AREA)

AAC blocks often receive a stucco surface for decoration. The special AAC decoration wall attracts attention, can easily be produced and provides a high selling margin for the AAC producers.



Vertically applied wall panels even with super smooth surfaces



Ready for painting – super smooth panels do not require plastering



The only super smooth cutter for tilt cutting systems comes from Wehrhahn

AAC tilt-up panels are an alternative for standard blocks or jumbo blocks.

In some markets home builders prefer these panels with super smooth surface. The market requirement is to avoid plastering and to apply paint or wall paper directly without any prior treatment. The system allows commissioning of panels for each individual building project already in the AAC factory.

In the past the required smooth surface could only be achieved by cutting systems with oscillating wires in a cake still in flat position during cutting (e.g. DUROX System). In those systems very long wires had to be used. The cutting accuracy could not reach cutting tolerances compared to Wehrhahn tilt cutting systems.

Smooth surfaces known from flat cake cutting systems with cutting precision known from Wehrhahn tilt cut systems are combined in one new machine at budget cost.

Wehrhahn engineers took the challenge to design a new machine which can provide super smooth surfaces without compromising on cutting accuracy. It took great efforts in research, design and testing before

the first machine was supplied to a customer in Germany.

Now more and more potential buyers show great interest in the **super smooth cutter**. Even existing plants can be upgraded (preferably SMART or superSMART) with the newly designed machine.

Mechanical and electrical design perfectly combined



Mechanical and electrical engineers work hand in hand from the beginning of the project

A precise coordinated interaction between the mechanical engineering and the electrical engineering determines the effectiveness, reliability and sustainability of a state-of-the-art production plant. Already many years ago Wehrhahn recognized the importance of the close cooperation between the mechanical and electrical engineers. At Wehrhahn all machines and plants are jointly designed and developed by electrical and mechanical engineers combined in one team. Only the

cooperation between the engineers right from the beginning of the design works can finally provide the optimum solution for any requirement and the ideal function and effectiveness of the machine developments.

The production plant consists of many individual machines. Its most effective operation sequence needs to be precisely coordinated. Furthermore many data must be exchanged between the machines. Advanced control systems supervise and



New concept: machine for the electric socket shortens the installation and commissioning time

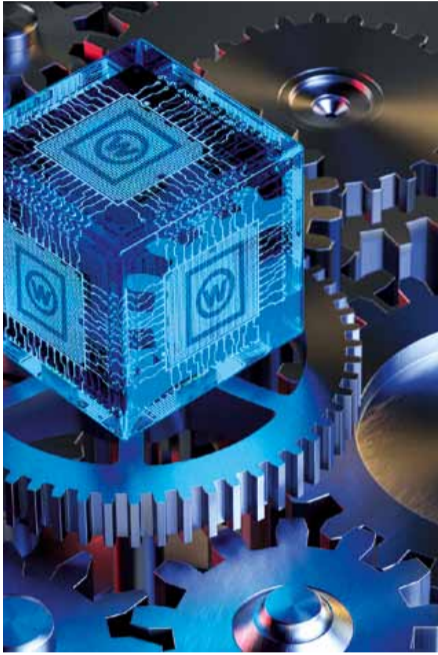
monitor all individual machines. Even today many production plants still need an enormous amount of cables in order to connect the drives of the machines with the electric control boxes. Here Wehrhahn has developed an important new and innovative concept, the so called “machine for the electric socket”, which has already successfully been implemented in many plants. The advantage: the machine can be pre-wired and a test run can be performed prior to delivery. “The machine for the

electric socket” is a joint development of mechanical and electrical engineers which facilitates the decentralized intelligence of the entire system.

The required cabling is reduced and time can be saved on site for the installation and functional test of the plant. Our mission is to provide customers with intelligent solutions which make them successful. This is only possible if mechanical and electrical design works are perfectly harmonized at an early stage of each project.



Wehrhahn plants go INDUSTRY 4.0



Industry 4.0 (the fourth industrial revolution) describes the self optimized production process. All parameters of the whole business value chain are taken into consideration by the direct link between contemporary decentralized automation, sustainable manufacturing technologies and intelligent data exchange.

The targets of an Industry 4.0 production plant ("smart factory") are:

- Decentralized intelligence into the machine
- The immediate connection between real production and virtual simulation for optimized process flow
- A self optimizing process for a high efficient and sustainable production.

WEHRHAHN INTELLIGENT CONTROL SYSTEMS COME WITH FEATURES WHICH FULFILL ALREADY THE TARGETS OF AN INDUSTRY 4.0 PRODUCTION PLANT.

- WH-PCI (product control and information system): collects all relevant production data in a data base.
- WH-EnMS (energy management system): records the energy consumption of each single machine and actively turns down consumers whenever possible to reduce energy consumption in the plant.
- WH Service Interval Indication: intelligent system which uses production data to display maintenance requirements in the plant. Preventative maintenance is a useful tool to increase the overall equipment effectiveness.

With Wehrhahn you already go for industry 4.0!

Successful with Wehrhahn AAC plants – The story of Stärken



Stärken will set up the second Wehrhahn superSMART plant

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

Traders are often squeezed in between, the suppliers want to raise prices, but the customers want lower prices. The 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 prod-

ucts and has already reached the maximal 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 by setting up a second AAC production plant from Wehrhahn. The additionally installed capacity will be already available within the 2nd quarter of 2017 – the Stärken success will continue!

New AAC production plants



Installation of the last machines at Baopeng in China

Another superSMART plant for China

Wehrhahn is the leading supplier of high-quality AAC production plants in China. Chinese investors prefer "Made in Germany" but only from Wehrhahn.

Here 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 customers in China can produce a total volume of up to 2.5 Mio. m³ per year.

Now the story of success continues: Baopeng from Jiangsu purchased a superSMART block and panel production plant. The project is in full swing and production is expected in the first half of 2016.

New customer in India

In addition to the Wehrhahn AAC block plants already in operation by HIL Limited in India, Wehrhahn is now supplying another state-of-the-art automatic 1,000 m³/day AAC plant to Shree Cement Ltd., one of India's largest cement producer.

Shree Cement have opted for Wehrhahn's plant considering Wehrhahn's extensive experience in economic production of consistent high quality AAC blocks, continuous technical support, and having supplied more than 120 AAC plants for blocks and panels world-wide.

The AAC block plant will have the potential for a further extension to 1,250 m³/day and can be operated with dry fly ash as well as with ponded ash.

The new plant coming up near Delhi is scheduled to be in operation by end of 2016.

International Wehrhahn Conferences

Wehrhahn worldwide

A number of Wehrhahn representative offices worldwide, for example in China, India, Iran, Russia, Saudi Arabia, Thailand, Vietnam, etc. ensure that our clients can always find us where and when they need us. Competent Wehrhahn partners and area managers with local knowledge and regional experience are at the disposal to advise and support our clients and new investors based on the local requirements.

If you want to meet Wehrhahn on international fairs and exhibitions, you are cordially invited to visit us in 2016 e.g. during:



BAUMA, Munich
The Big 5 Saudi, Jeddah
Middle East Concrete, Dubai
BAUMA China, Shanghai

More information on:
www.wehrhahn.de

10 years Wehrhahn plants in Russia

During the 4th Wehrhahn AAC conference in Russia held in November 2015 in Nishniy Novgorod over 60 specialists met for conferencing and networking. They represented our more than 40 Wehrhahn clients in Russian speaking countries and shared valuable experience among each other together with Wehrhahn specialists. Some of the investigated topics were, e.g. latest Wehrhahn developments and improvements, plant operation management, electric energy management and many more.

The participants highly appreciated the dynamic style of the conference and collected many new ideas useful for day-to-day operation. One of the highlights of the conference was the visit of the new Poritep SMART plant which was just opened in summer 2015 in Nishny Novgorod area.



Networking on the occasion of the 4th Wehrhahn AAC conference in Russia

Stunning new features in latest generation of fibre cement sheet production plants

In recent projects Wehrhahn added stunning new features to its fibre cement production plants. Our aim is to secure the leading global position in plants and technologies for state-of-the-art fibre cement sheet production plants.

NEWLY DEVELOPED FEATURES CAN BE FOUND IN ALMOST ALL SECTIONS OF THE PLANT. HERE SOME OF THE HIGHLIGHTS:

- sheeting machine: optimized vat geometry for better slurry flow around the sieves and consequently better pick-up. Completely new is the “internal overflow recirculation” which improves filtration on the sieves and is exclusively available with Wehrhahn
- changing the felt of the sheeting machine has been made easier – a feature which saves time and money
- optimized “high performance” spray pipes increase the lifetime of the felt and provide more consistent process conditions during production
- detailed analysis of the airflow in the vacuum boxes have been the basis for the newly designed vacuum boxes which allow higher felt speeds and consequently higher output of the plant
- the layer-breaker is now operated by servo-drive and a special electronic timer synchronized with the forming roller

For our readers, interested in technical details: 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.



Masterpiece in the industry: The Wehrhahn sheeting machine



Newly designed fibre cement production plants



Highspeed electro-mechanical stackers

Fibre cement production plants for autoclaved flat sheets

There is a growing demand for high quality autoclaved fibre cement sheets in many markets. Autoclaved flat sheets offer significant advantages:

- lower production costs due to replacement of expensive binders by finely ground silica sand

- high strength at low densities and highest dimensional stability thanks to the unique tobermorite crystal inside the sheet matrix

Wehrhahn is considered as leader in plants and technology for fibre cement sheet production. Especially the outstanding know-how in autoclaved building materials was the key argument for two buyers to invest in latest Wehrhahn technology for fibre cement sheet production.

El Toro Roofing in Sri Lanka

Sri Lanka is one of the fastest developing countries in Asia. The leading supplier of corrugated roofing sheets, Rhino Roofing, has invested into the future.

Wehrhahn will supply a state-of-the-art turn-key production plant for the production of autoclaved flat sheets. The plant will come with all newly designed features which have been communicated in this journal. The start of production is expected in 2016. It will be the first plant for autoclaved fibre cement sheets in the region. Sheets will be sold under the brand name

“El Toro” and will be used for internal application (backer boards) and for exterior cladding.

New player in the Turkish fibre cement sheet market

The well-known TEPE Group from Ankara has been convinced of the many competitive advantages of autoclaved fibre cement sheets. Wehrhahn supplied key equipment for the recently installed plant near Ankara. The new plant is designed for the production of flat sheets for exterior and interior use, such as façades, cladding and tile backer applications.



Newly designed sheeting machine for even higher outputs and optimised process control

Redesign of the Wehrhahn website & new Wehrhahn video

Presented in a completely new design and modern layout: The new relaunch of our website www.wehrhahn.de goes online.

Although much has changed, all of the contents we have created over the years are still part of the new site. But even more than a new look our homepage offers an all-in-one-solution giving comfortable handling and overviews on latest Wehrhahn technologies and services for AAC, fibre cement, lime and dry mortar production plants and much more.

Keeping you up to date on all the latest news and events, the design has also been optimized for modern use. The updated structure is compatible to latest technology focusing on multimedia use, on multiple mobile devices, like iPad, iPhone, Android phone...

Within comprehensive sections for all our products and solutions please find quick views, pictures, videos, brochures, catalogues, flyers and much more.



Equipment for processing of quicklime for AAC production: burning, grinding and slaking

Hard burnt lime for the production of AAC, soft and medium burnt lime for the metallurgical industry, hydrated lime for the production of dry mortars, crushed stone and limestone flour for agriculture, chemical industry, road construction – this is not a complete list of scopes of limestone and lime application.

Reliability and consistency are the key factors to facilitate the automatic production of high quality AAC. The ideal lime for AAC has a slaking time of 4 - 12 min. up to 60 °C. Lime which complies with the specification is often not available near production facilities. As a consequence more and more AAC producers are adding a lime kiln near to their AAC production plant to control the quality of the lime.

Wehrhahn offers turn-key lime production plant solutions which include crushing the lime stone rocks, burning in a high temperature single shaft kiln, fine grinding and even slaking to produce hydrated lime.

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 builds and supplies several turn key lime production plants for clients in Russia. The capacities range from 100 and 200t/day of finely ground quicklime and hydrated lime. Shaft kilns offered by Wehrhahn with controlled burning process by adjustable burning lances as well as by the exact quantity of air and fuel are optimal for the production of uniformly burnt high quality lime.

ADVANTAGES OF THE OFFERED SHAFT KILNS:

- **Most economical (minimum) volume of the kiln reduces the investment of the kiln shell, metal structure and brick-lining**
- adjustable temperature of burning process, allowing to burn "on demand", producing soft or hard burnt lime
- the lowest power consumption (30 - 50% less than in rotary kilns) through the re-use of heat obtained by the cooling of already burnt lime
- wide range of lime stone sizes to be burnt

Lime grinding

The production of AAC, silica brick, hydrate lime and other products require finely ground lime. Wehrhahn supplies roller mills for effective lime grinding.

Single shaft kilns with adjustable burner lances allow a precisely controlled burning process of temperatures of 900 up to 1,300°C ideal for soft, medium and hard burnt lime.



Thin bed mortar – upgrade your product portfolio

High quality AAC requires high quality thin bed mortar

AAC construction sites all over the world proved that thin bed mortar is the perfect fit to all kinds of AAC applications.

A thin bed mortar layer of just 2 mm is easy to put on and complies with the applicable country building codes. Depending on the wall thickness, approximately 2.6 kg to 3.6 kg of mortar per square meter wall surface is needed. This results in a quantity of approximately 18-20 kg mortar per cubic meter of AAC which has to be purchased by the end user. This offers new business opportunities for the AAC producer. Experience has shown that buyers are more price sensitive in respect of AAC rather than on the supplementary products, such as e.g. dry mortar. The investment for a dry mix production plant is not very high and the plant can easily be installed next to the AAC production plant.

The sales slogan **"one solution & one quality – from the building material to the finished wall"** is a perfect sales argument for each AAC producer.

- Thin bed mortar – the perfect solution for AAC applications**
- mortar production results in very positive revenue/margin
 - easy quality control of AAC and dry mix in the same factory
 - strengthening of building material sales strategy with "self-made mortar"
 - development of "new" mortar products and application solutions according to customer demand (future innovative dry mortar products: internal/external plaster, repair mortar)

STANDARD THIN BED MORTAR
 Typical mortar production calculation (raw materials consumption per ton)

	exemplary recipe	approx. costs
Binder (cement)	25 %	26.00 €
Filling material (quartz powder)	10 %	6.00 €
Aggregate (quartz sand)	65 %	6.20 €
Additive (cellulose)	0.30 %	16.80 €

The simple calculation of the mortar raw materials should support the "make or buy" approach of each AAC producer.



Excellent support for our clients – whenever required!

It is a main objective of Wehrhahn that all production facilities provide first class products during their entire lifetime in order to ensure our clients' competitiveness and success in the market. Therefore, our focus is to continuously develop and improve our service to ensure the individual support for all Wehrhahn clients. The Wehrhahn telephone hotline provides quick solutions for technical questions and our comprehensive Wehrhahn advice for spare parts

provision avoids production downtime due to lack of suitable parts. The Wehrhahn remote service via internet enables swift and simple support for electric control and operation of Wehrhahn plants. Another advantage: Our clients are in direct exchange with our experts and benefit from their experience.

Due to the positive feedback from many clients around the globe, we have recently

set up a systematic Wehrhahn plant check service program in order to assist our clients in maintaining and improving the output of their production facilities. A team of Wehrhahn experts spends a visit to your facilities to carefully check your production facilities section by section.

Our experience has shown: A low investment results in a measurable success!



Service which really arrives. Wehrhahn specialists carry out a plant assessment together with the customer

AAC for sustainable construction (EAACA paper)

The European Autoclaved Aerated Concrete Association (EAACA) published a spot-on article concerning "Sustainable Construction". The full paper can be downloaded from the EAACA website under: www.eaaca.org.

Here some excerpts:

"The question whether a building is sustainable or not is not easy to answer. So far there are no international standards concerning sustainability. However different models of assessing sustainability already exist in most European countries. Most people think sustainability only includes environmental aspects. But most models assessing sustainability have a broader ap-

proach and also assess economic, technical, and social aspects.

The choice of the right building material is one of the key factors for sustainable buildings. Autoclaved aerated concrete is a building material which offers considerable advantages over other construction materials. Autoclaved aerated concrete's high resource efficiency gives it low environmental impact in all phases of its life cycle, from the processing of raw materials to the disposal of AAC waste."

The combination of "environmental and technical performance" make AAC the perfect wall building material for future generations.



AAC - The wall building material for the future

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.

This reduces the risk of sticking significantly and enables smooth production conditions in the packing plant.

Innovative fixing system in the mould

Depending on the reinforcement up to 160 fixing pins are required per mould to hold the reinforcement in place. An efficient production process needs a fully automatic system for fixing the reinforcement to the fixing pins. Wehrhahn has already designed the perfect solution for the task. The Wehrhahn system works with an automatic locking and unlocking mechanism which facilitates shorter cycle times and consequently higher plant output. Even better: the automatic production process requires less manpower!



Automatic reinforcement manufacturing process

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

Wehrhahn supplies machines for mat and cage welding with different degrees of automation to meet the individual requirements of every customer. Starting from simple mat welding machines up to fully automated solutions from the coil up to the finished cage. Functional assembly places and automatic coating plants for the reinforcement complement the Wehrhahn scope of supplies.

Precise and easy to manage: The new Wehrhahn technology for lintel production

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