

JOURNAL

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

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TRADITION AND INNOVATION COME TOGETHER

Fit for the future!

Sometimes the time is ready for a new approach in order to remain fit for the future for the company, customers and employees.

The old buildings at our headquarters were no longer up to date and cost-intensive, both in terms of their structure, fabric and energy efficiency. Therefore, we decided to build a new building. This new office had to be modern, sustainable, environmentally friendly and unique – the perfect alliance of tradition and modernity – that was our vision.

After having demolished the old buildings, a completely new, contemporary building was

constructed. Once completed, at the end of 2024, the 3-storey building features around 3,000 m² of office space, a laboratory and a training center. Conference rooms, cafeteria and a restaurant with a roof terrace offer



functionality as well as a great atmosphere. Designed using state-of-the-art technology,

Wehrhahn relies on environmentally friendly, resource-sensitive solar and geothermal energy, including a green roof.

At the same time, we have added the new 'Development & Technology' department to our expanded R&D and Technology Center. This is where potentials are identified, ideas evaluated and implemented in order to develop products for the future that meet global requirements, are energy-efficient and reduce the ecological footprint.

The perfect alliance of tradition and modernity

We are ready to meet the challenges of the market. In a completely new design, Wehrhahn offers the proven highest →



TRADITION AND INNOVATION COME TOGETHER

Recently completed: The brand new Wehrhahn headquarters



quality in accordance with our objective 'Everything from a single source' and continues to be the competent partner for our ambitious customers in the aerated concrete and fiber cement industry.

We are looking forward to your visit at our headquarters in Delmenhorst!

Exciting new features of the new Wehrhahn building:

- 3000 m² of innovative office building
- fully equipped training center for customers
- new and extended R&D and Technology Center
- geothermal heating and solar power



TWO STRONG PARTNERS JOIN THEIR FORCES

Wehrhahn Teeyer Smart Technology Corp. Ltd. established in China

After being the number one European equipment supplier for AAC and fibre cement in China for more than 20 years, we are pleased to announce our cooperation with Teeyer from Changzhou.

The joint venture company 'Wehrhahn Teeyer Smart Technology' was established to complement the key equipment supplied by Wehrhahn from Germany in projects where customers intend to procure the equipment specified as 'local' or 'buyer' supply through a reputable single contractor. It enables Wehrhahn together with the Joint Venture company to offer cost-attractive turnkey solutions to customers around the globe.

Our partner Teeyer from Changzhou is a listed company with an excellent reputation in the Chinese market. Prior to the establishment of the joint venture, the parties realised several projects. Wehrhahn supplied the key equipment from Germany and Teeyer completed the 'local' delivery according to Wehrhahn's drawings and specifications.

Deeper co-operation in the form of a joint venture is now the logical consequence.

Customers who are interested in such cost-efficient turnkey solutions are cordially invited to contact us!





DIFFERENT TECHNOLOGIES FOR HANDLING AND CUTTING AAC CAKES

Tilt cake cutting versus flat cake cutting

There are two main methods for handling and cutting a green AAC (Autoclaved Aerated Concrete) cake, which have been developed and optimised over decades. The first method involves tilting the cake onto a cutting pallet, while the second method involves transporting the cake using a grab crane. The choice of method has a significant impact on recipe cost and cutting technology.

Transport of the cake into the cutting line

Here the mould is tilted by 90 degrees (upright position), and the cake is gently brought into an upright position and placed onto a cutting pallet. On this pallet, the cake passes through the cutting line.

In contrast, in flat cake cutting systems a grab crane squeezes the two longitudinal sides of the cake, lifts it, and moves the cake to the cutting line to lay it (flat position) onto a grid.

It is important to note that a cake being squeezed by a grab crane requires a higher hardness than a cake that is gently tilted while still resting on its mould. This higher hardness is achieved by a higher amount of binder, mainly cement, and/or by an extended precurving time, which requires a

higher number of moulds and more space in the precurving area. The higher content of the binder leads to significantly higher recipe costs compared to tilted cakes.

Cutting and profiling

When it comes to cutting and profiling, the tilted cake method has several advantages. After tilting the cake, 5 sides of the cake are accessible. While the cake is moving through the cutting line, wires and knives can easily cut and profile all sides of the cake.

All cutting wires can be very short (approx. 75 cm (3 in)) which facilitate best possible cutting accuracy.



Tilt cake cutting: less binders and shorter precurving times

	Flat cake cutting	Tilt cake cutting
Binders content	higher	lower
Precuring time	longer	shorter
Number of required moulds	higher	fewer
Profiling of blocks and panels	2 separate steps bottom profiling of the cake whilst hanging in the grab crane	1 step easy cake access from both sides
Closing of gap caused by the cross cutter	before the thickness cut, gaps need to be closed by pushing the entire cake from both ends	not applicable



Easy and precise profiling in tilt cutting systems

In Detail

	Flat cake cutting	Tilt cake cutting
①	Cake transport from mould to cutting line Grab crane (cake remains in horizontal position)	① Cake transport from mould to cutting line Tilting (90°) into upright position
②	Profiling part 1 First the bottom side of the cake, while still hanging in the grab crane, with knives or even after autoclaving with milling machines (accuracy critical)	② Profiling Both sides of the cake simultaneously with stationary knives. Recycling of cut-offs by gravity (no suction needed) (accuracy very precise)
③	Block height or panel length cutting Cutting with long wires from underneath (in some new concepts with shorter wires from the side)	
④	Closing the created cutting gaps by pushing the cake from both ends	
⑤	Thickness cutting Vertically oscillating wires	③ Thickness cutting Stationary (or optionally oscillating) horizontal wires
⑥	Block length or panel width with oscillating horizontal wires	
⑦	Profiling part 2 With knives or even after autoclaving with milling machines	
		④ Block height or panel length cutting With oscillating wires, recycling of top cut (small size 6 m x 0.6 m)
⑧	Recycling of top cut (large size 6 m x 1.5 m)	
⑨	Crumbles and other remains on the top side of the cake are removed by vacuum	



Uniform distribution of cutting wires reduces stress during thickness cutting

NEWS FROM THE WEHRHAHN FIBRE CEMENT WORLD

Fibre cement projects around the globe



Sri Lanka: El Toro Roofing Products

... has recently expanded its successful production of autoclaved flat sheets. A new Wehrhahn line has been installed, this time for PVA fibre reinforced corrugated sheets. Both autoclaved and corrugated sheets are exported and appreciated worldwide.

Their website www.eltoro.lk states "We are the first company in Sri Lanka to manufacture eco-friendly fiber cement products and related accessories from 100% eco-friendly raw materials. We have invested in the latest high technology and machinery from Germany."

The new fibre cement line is equipped with all the latest Wehrhahn innovations.

The sheet thickness control enables highly practicable production and significantly reduces the carbon footprint of the production process. Another innovation is the highly flexible waterjet cutting system, which is being used for the first time in a plant for the production of corrugated sheets. Both autoclaved and corrugated sheets are exported and appreciated worldwide!

The Wehrhahn team would like to thank the entire El Toro team for their excellent cooperation on this project. Here is the result:



Ukraine: Ivano-Frankivsk – IFCEM

Expansion to autoclaved flat sheets production

Despite the war in Ukraine, there are investors who are optimistic about the future and are already preparing for the 'time after'. Ivano-Frankivskcement is a cement manufacturer from the city of the same name, Ivano Frankivsk, in Western Ukraine.

After expansion of the existing fibre cement plant for the production of air-cured fibre cement panels, now also autoclaved flat sheets can be produced. In addition, an existing press located away from the production line is to be integrated into the sheet production process. The special highlight of this project is that the

plant components to be supplied by Wehrhahn can later be integrated into a new line to be built without having to be re-arranged. The current investment can therefore also be fully utilised for a planned new plant.

Previously, the Wehrhahn laboratory had already carried out tests with the local raw materials which have been successfully verified in the existing plant. The installation and commissioning was carried out entirely by RTS.

Thanks to all those involved!

Saudi-Arabia: El-Khayyat Group

The installation of the entire fibre cement plant was subject to a very tight schedule.

However, shipping directly to the Red Sea via the Suez Canal was restricted or no longer possible. As a result, the machines had to be shipped from Germany via the longer route around the Cape of Good Hope to the Persian Gulf in Dammam. This initially led to a delay of around several months. No effort was spared to at least partially make up for the lost time. The result is impressive: Since December 2024, the new fiber cement plant has been ready for production in all areas and can produce saleable autoclaved panels. The operator of the plant, El-Khayyat, is very satisfied with the result.



– Uwe Kroh,
Senior Service Engineer

"Never before has there been a Wehrhahn construction site with so many workers working in so many areas at the same time in such a short period. However, this also meant that our customer demanded the same from Wehrhahn and requested Wehrhahn colleagues very early on, who then also had to take on some of the actual local work, e.g. the I/O check, in order to meet the planned commissioning deadline. Despite these challenges, the great cooperation of all those involved ultimately made it possible to set up the plant in YANBU and get it running in this short period of time. Our thanks go to the El-Khayyat team and the Wehrhahn colleagues, who all gave their best."





NEWS FROM THE WEHRHAHN AAC WORLD

AAC projects around the globe

Worldwide unique plant upgrade in Romania

Wehrhahn upgraded the aerated concrete block plant for Elpreco SA in Romania to a capacity of 1,900 m³/day. The Wehrhahn mixing system WE-COMIX and a worldwide unique mould handling technology significantly reduced manpower, precuring time and energy consumption. The Wehrhahn Master Control Server (MCS) brings together production data from all sections and provides the user with information

ranging from production and energy management to quality control and preventive maintenance. Through a strong partnership and trusting cooperation, ambitious goals and forward-looking ideas can be realised – even under the most difficult conditions!

Please read more:



Before: Labour intensive and inefficient



After: Utmost efficient precuring management



Romania: Installation progress in Târgu Cărbunești

Wehrhahn customer Soceram from Romania orders its second Wehrhahn plant. After the first PLUS, this time it will be a SMART of the latest generation. Production start is scheduled at the end of 2025!



Coming soon: Ekoru from Volla in Italy

... is an innovative solution provider for the construction industry. Ekoru developed a system for prefabricated wall systems using AAC. The system is based on individually finished elements, made to measure already in the factory with patented technologies and ready to be

assembled on site. This new approach requires high-quality AAC products and consequently Ekoru decided to order a state of the art AAC cutting plant from Wehrhahn. Machines will be shipped to Italy soon. Stay tuned for more news!

AAC production in Libya is a living reality

The delivery for an AAC block plant, type B6-1400-PLUS, with 1,440 m³/day production capacity, was finalised towards end of 2010. After preparations for the construction site had begun, armed conflicts in 2011 jeopardised the realisation of the project. Against all odds and despite the turbulent years, Economic Inmaa Co. and Wehrhahn together with strong local partners managed to complete the construction of the system in 2017. Finally, the plant was put into fully automatic operation at the beginning of 2022 with the help of the Wehrhahn remote service team.

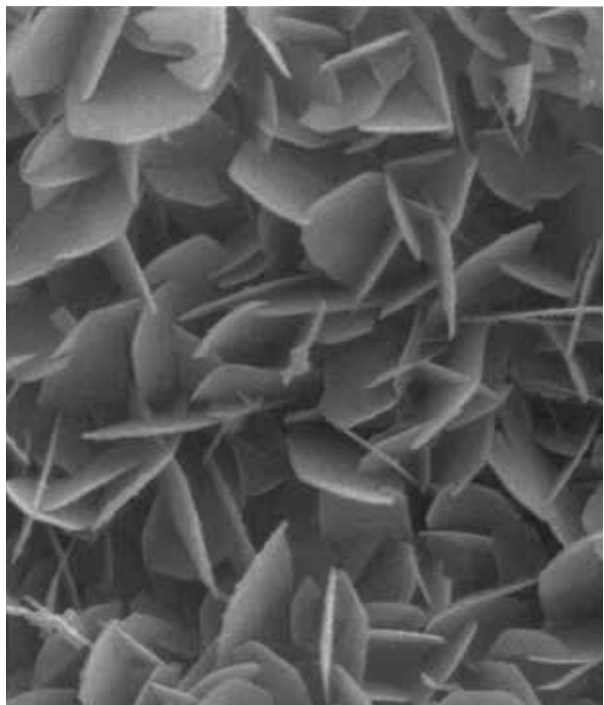


FAQ: Useful information and interesting facts!

Why do autoclaved fibre cement sheets shrink less than air-cured sheets?

During autoclaving crystallised CSH phases are formed. SiO_2 starts to be dissolved and forms with Calciumhydroxide and water a crystal (11A Tobermorite) which is also available in nature.

The degree of crystallisation is the reason for the reduced shrinkage rates of autoclaved fibre cement sheets in comparison to air-cured products.



Tobermorite is formed during autoclaving and provides special characteristics to AAC blocks and panels and fibre cement sheets

How important is autoclaving to achieve the outstanding properties of AAC?

Rumours say that autoclaving is only needed to facilitate faster curing. In fact, autoclaving is much more than accelerated curing. In saturated steam conditions at approx. 180 °C the solubility of SiO_2 is significantly increased. It can now react with the $\text{Ca}(\text{OH})_2$ and form a crystal (Tobermorite) which gives autoclaved aerated concrete (AAC) it's characteristic unsurpassed properties. High strength in relation to its low density, excellent dimensional stability (low wet-dry shrinkage) and low thermal conductivity.

Autoclaving also helps to reduce the carbon footprint since large quantities of binding materials are substituted by finely ground silica sand. This is not only an argument in view of ecological aspects but also helps to reduce costs in comparison to conventionally air-cured concrete products.



Autoclaving improves the material properties and contributes to sustainability

What is the difference whether an AAC mix contains more lime or more cement?

It makes almost no difference to the quality of the end product whether more lime or more cement is used; in extreme cases, only lime or only cement can be used as a binding agent. However, the lime/cement ratio is often of decisive importance for process control. Lime reacts comparatively quickly and significantly increases the temperature in the mixing phase and at the start of the pre-curing period.

Cement reacts later and tends to determine the final temperature of the cake; more lime is beneficial when the raw materials and equipment are cold (e.g. in winter). If the raw materials and equipment are warm (e.g. in summer), less lime is often used and consequently more cement instead. The lime/cement ratio is primarily important for controlling the temperature of the process. Beside the question of technology, also the price of lime and cement has a decisive influence on the chosen ratio.



More lime is favorable when the raw materials and equipment are cold (winter)

When they are warm (summer) less lime and more cement is used instead

COMPRESSED FIBRE CEMENT SHEETS

When is a press useful?



In a stack press flat fibre cement sheets are compressed to achieve higher product density.

Before entering the stack press a mixed pile of fibre cement sheets and flat steel plates is formed. The stack height typically reaches 1.2 m in height. Inside the press huge hydraulic cylinders apply pressure on the mixed pile in-between the upper press plate and the bottom table.

During the press cycle of approximately 30 minutes the pressure is gradually increased causing water to leave the sheets through the sheet edges. The sheet thickness is reduced by 25 to 30% which corresponds to an increased

sheet density. The higher density of the sheets enhances the strength and durability of fibre cement products. Porosity of the sheets is reduced and consequently the freeze/thaw resistance of the sheets is improved. Additionally the sheet surface quality (smoothness and tolerance) is significantly better in comparison to non-compressed sheets.

Some technical details of a Wehrhahn stack press for autoclaved fibre cement sheets production:

Machine weight: 350 - 400 t
Press pressure: 14,000 t
Max. sheet length: up to 6 m



IS YOUR PLANT STILL WORKING EFFICIENTLY?

Wehrhahn plant inspection – little investment, big benefit!



Continuous improvements and ongoing development are essential for sustainable company development.

Our experts analyse your production processes and show you ways how to modernise economically, taking into account the current Wehrhahn standards. The focus here is primarily on the potential for energy savings and optimisation of plant efficiency (OEE).

Together with you, we check all machines and processes on site. This customised analysis is extremely effective, as the experienced view of our professionals quickly provides clarity. Improvements can often be achieved by making just small changes to procedures or by optimising processes. In addition, preventive maintenance avoids shutdown times.

Furthermore, your employees can extend their field of knowledge and understanding of the production process through training and education programmes. This is a comparatively low investment that brings considerable added value.

Our experienced experts prepare a clearly understandable and reliable list of priorities. They recommend follow-up measures and thereby provide a useful basis for the profit-orientated development of your company.

Is this an option for your production plant?
Please contact us: mail@wehrhahn.de

THE WEHRHAHN SERVICE
for successful plant operators!

SEE WHAT'S GOING ON?

More about Wehrhahn



Stay up to date on our website or subscribe to our LinkedIn and Youtube channel. Find out more in our regularly published articles in 'AAC worldwide', an international journal for AAC in English and Chinese language.

INTERNATIONAL TRADE FAIRS, CONGRESSES AND CONFERENCES

Meetings face-to-face

Trade fairs and conferences, conventions and association meetings worldwide: There are many opportunities for personal dialogues.

We look forward to seeing you: bauma Munich, bauma Shanghai, EAACA and IIBCC, KazBuild and UzBuild and many other events: stay informed via our website where you can meet us and our international representatives!



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