TECHNOLOGY PARTNER FOR CALCIUM SILICATE UNITS

INNOVATION BUILT ON EXPERIENCE

TURN-KEY PLANTS

CORE TECHNOLOGY

PLANT SERVICES

INDUSTRY SOLUTIONS

CALSITEC
by AIRCRETE

OUR MISSION

"TO PROVIDE GREENER, FASTER AND BETTER BUILDING TECHNOLOGIES FOR THE WORLD OF TOMORROW."

ABOUT CALSITEC

Calsitec is a brand under the flag of Aircrete Europe, one of the recognized global leading developers and manufacturers of Autoclaved Aerated Concrete (AAC) machinery and technology for the production of AAC panels and blocks.

Calcium-silicate units (also known as sand-lime bricks) are a closely related building product to AAC in terms of raw materials, production process and construction projects. Through the acquisition of the intellectual property of the former WKB Systems, Aircrete has expanded the product portfolio to now also supply calcium silicate technology under the Calsitec brand.

With an international team with decades of experience and sales on 6 different continents, we design and deliver the most innovative turn-key AAC and calcium-silicate units (CSU) plants and cutting-edge plant technology.

Our solutions include turn-key, core technology, plant services and industry solutions. As your long-term technology partner, we guide you through all the steps of planning, building and operating your AAC and CSU factory.

TURN-KEY PROJECTS

CORE TECHNOLOGY

PLANT SERVICES

INDUSTRY SOLUTIONS

- **Long term technology partnerships with producers worldwide**
- **International organization and footprint through projects with 100+ factories**
- **Custom solutions to meet clients demands**
- **Complete building solution for all construction segments in a perfect combination with AAC**

CALCIUM-SILICATE UNITS (CSU)

ENVIRONMENTALLY FRIENDLY BUILDING MATERIAL

CSUs are made from natural materials like sand, quicklime and water. They are suitable for both exterior and interior walls and can be combined with other materials, such as wood, to create various types of facades. Sand-lime bricks are known for their durability, sound insulation and strength.

Due to their high density and weight, CSUs offer excellent soundproofing, allowing for construction of slim, noise-absorbing interior walls. They also have strong heat retention properties, helping to regulate rapid temperature changes effectively.

FLY ASH BRICKS

Calsitec technology also enables the production of fly ash bricks. Fly ash, a fine combustion byproduct from, for example, coal-fired power plants, contains silica and can replace sand in environmentally friendly brick manufacturing. Both sand-lime and fly ash bricks are ideal for new buildings and renovation projects. They are suitable for single-family homes, multi-family homes, multistory buildings and commercial constructions.

THE UNIQUE ADVANTAGES OF SAND-LIME BRICKS OUTPERFORM CONVENTIONAL BUILDING MATERIALS

- FIRE RESISTANT
- SOUNDPROOF
- NATURAL MATERIALS
- STRONG
- NATURAL REGULATOR
- VERSATILE
- ACCURATE
- DURABLE

CHARACTERISTICS

Healthy indoor climate

CSUs promote a healthy indoor environment by balancing air supply, humidity and temperature. Their moisture-regulating properties help prevent mold growth by absorbing excess humidity andreleasing it when the air dries. This makes them effective at maintaining healthy humidity levels indoors.

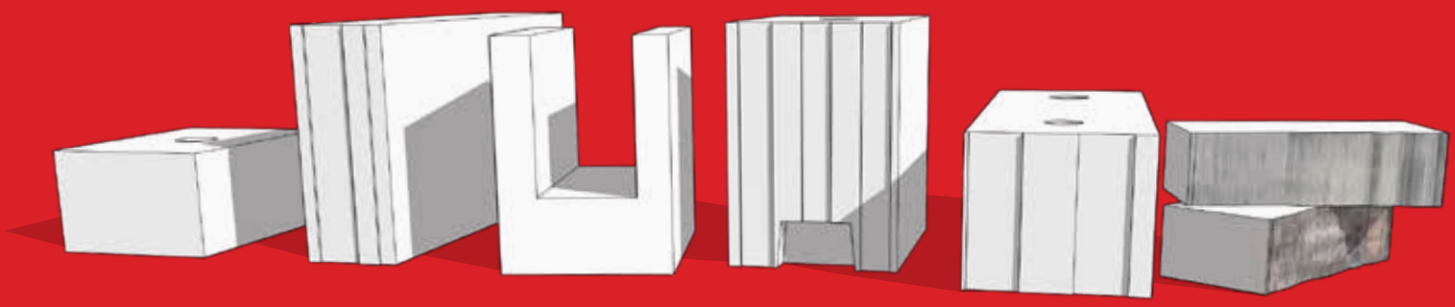
Fire resistance

CSUs are highly fire-resistant, thanks to their raw materials and production method. Therefore, they are suitable not only for exterior and interior walls but also for firewalls, basement boiler rooms and partition walls. However, unlike AAC, CSUs can be compromised if the temperature exceeds 600°C.

Sound insulation

Effective sound insulation at home or work is essential for comfort and well-being. The weight and density of CSUs make them superior to other materials, providing better soundproofing for walls of the same thickness.

LARGE VARIETY OF CALCIUM-SILICATE UNITS



Robustness

CSUs are highly durable due to their structure. Different strength categories of these bricks can be produced using Calsitec technology.

Green density

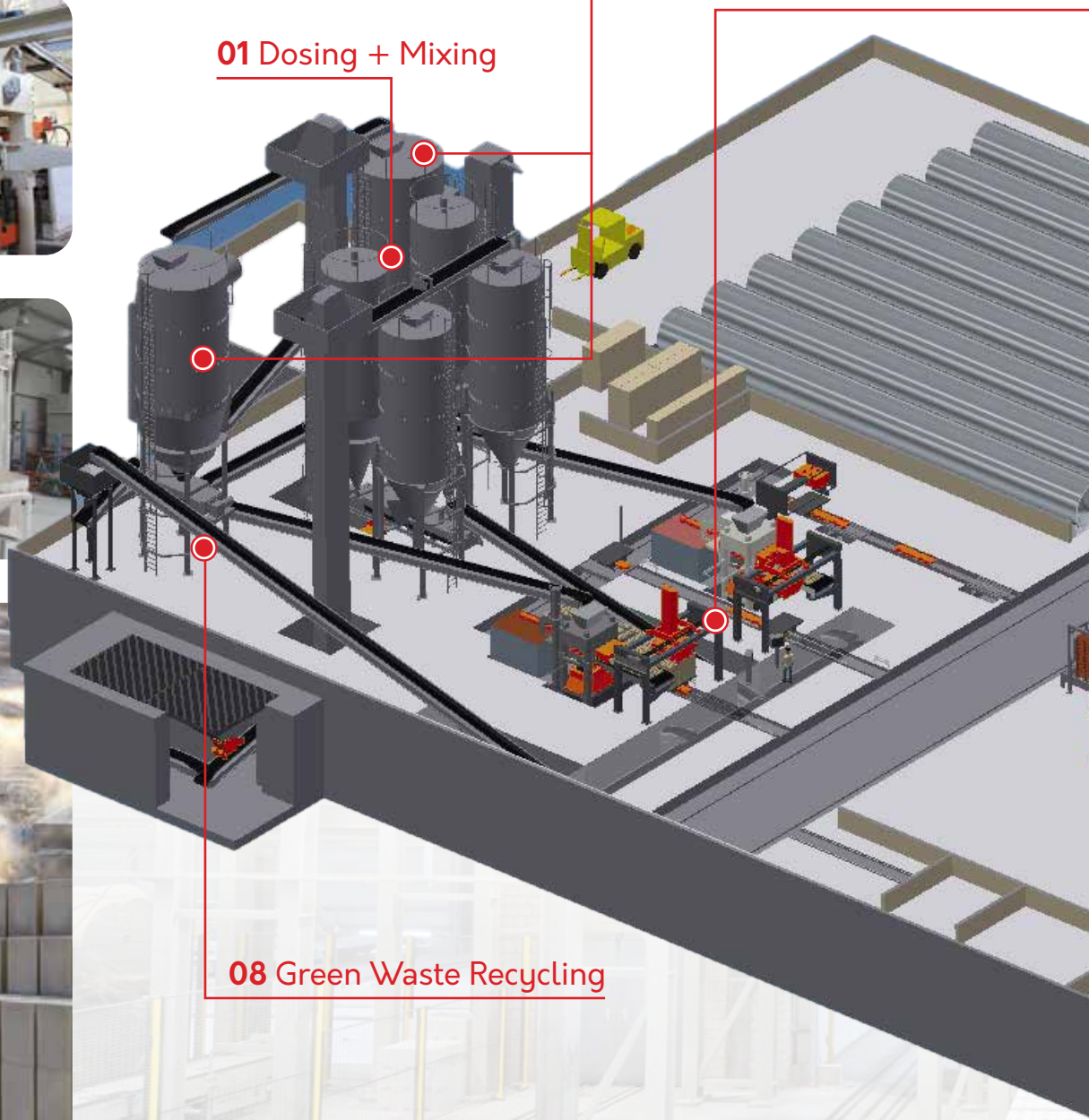
Ranges from 0.91 to 2.20 kg/dm^3.

CALSITEC PLANT

HIGHEST AUTOMATION STANDARDS
FOR THE CSU PRODUCTION

BROAD PRODUCT PORTFOLIO

COMPACT PLANT DESIGN



LESS FOUNDATIONS

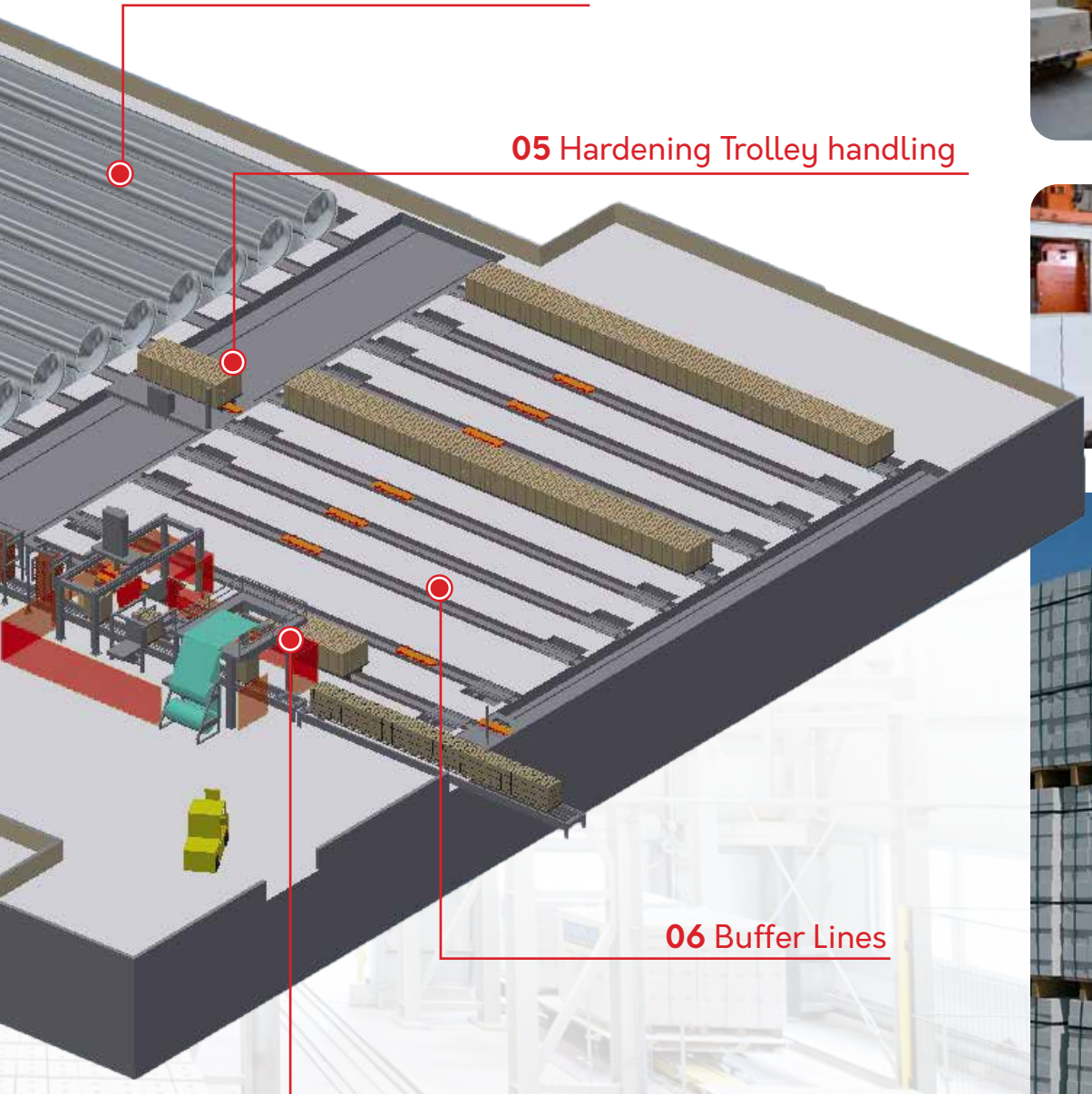
HIGH FLEXIBLE
UNLOADING SOLUTIONS

VALUE ADDING SOLUTIONS

03 Hydraulic Presses

04 Autoclaving

05 Hardening Trolley handling

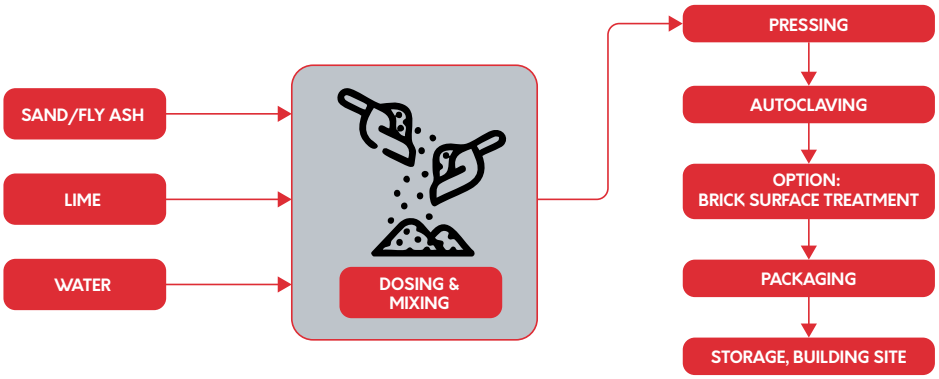


06 Buffer Lines

PRODUCTION PROCESS

RAW MATERIALS AND MIXING PLANT

Raw materials used in the production of CSUs are silica sand, quicklime (as a binder) and water. Alternatively fly ash could be used instead of sand. The suitability of fly ash must be checked in special tests. Furthermore the production of cement-bound bricks is possible.



Every raw material is stored separately. According to the production recipe sand/fly ash and lime are weighted in weighing containers and forwarded to the mixer. Here the raw materials are mixed to a homogeneous mixture in short time. According to the sand moisture and the recipe some water can be added to the mixture. One mixing cycle lasts for ca. 3 minutes.

Furthermore the sand lime mixture is conveyed into the reactor. After the reaction time some water is added to the mixture in the remixing plant to have the required moisture for pressing. After that the mixture is forwarded to the color mixing plant (optional) or to the sand lime brick press.

Mixing plant

Calsitec mixing plants ensure the best product quality. They consist of:

- **Sand, sieve and bunker unit**
- **Silo**
- **Conveying and dosing unit (scales)**
- **Premixing plant**
- **Reactor**
- **Remixing plant**
- **Control system**
- **Color mixing plant (optionally)**

The following raw materials are processed there:

- **Sand/fly ash**
- **Lime**
- **Water**
- **Color particles (in case of production of colored bricks)**
- **Cement (in case of production of cement-bound bricks)**

HYDRAULIC PRESSES

Presses are the heart of a CSU plant. Calsitec presses ensure the production of high-quality CSUs in an automated way.
All Calsitec presses are of a cast tie-rod design. This stable construction guarantees longevity and outstanding product quality. Its design and electronic control unit are state-of-the-art. The technique ensures an individual modern production process that answers all the enquiries of the customer.

WKP: capacity that impresses

The Calsitec WKP hydraulic press impresses with its production capacity. Up to 10,000 bricks can be pressed in one hour with a maximum press power of up to 750 tons. Another advantage of the press is its compact design.
It can be installed/integrated without any problems in existing factories to replace machines with lower productivity.

Removal of the product from the pressing table, can be offered in a simple version with the gripper on the charging carriage, hereby compacting the product in the gripper. Alternatively, a more advanced option whereby the product is gripped from the side in combination with a lifting/lowering table, can be offered.

The standard WKP 750 works with a bunker whereby the charging carriage cuts off the material flow. In the WKP 850 version a bunker with flap is installed for better filling of the mould.
For loading the hardening trolleys, Calsitec offers a conventional brick packing manipulator or as an alternative the brick packing robot, which is ideal for loading pyramid-stacking-patterns for optimized autoclave filling.

	WKP 750	WKP 750S	WKP 850
CONSTRUCTION:	Cast tie-rod		
MODE OF OPERATION:	hydraulic		
COMPACTION:	one-sided		
PRESSING FORCE: • Max. (at 315 bar) • Operating pressing force (up to 250 bar)	8,250 kN 6,550 kN		
MAX. STROKE (mm)	450		
MAX. BRICK HEIGHT (mm):	250		
CYCLE TIME / STROKES: • Brick size up to 115 mm • Brick size up to 250 mm	10.0 s / 360 h^{-1} 12.5 s / 288 h^{-1}		
OUTPUT/STROKE (L x W x H): • NF (240 x 71 x 115) • 4 DF (248 x 115 x 238/249) • 6 DF (248 x 175 x 238/249) • 8 DF (248 x 240 x 238/249)	26 16 10 6		
THEORETICAL PRODUCTIVITY NF BRICKS:	9,360 NF/h		
WAY OF FILLING:	With lifting/lowering table without Bunker Flap		With lifting/lowering table wit Bunker Flap
WAY OF PRODUCT REMOVAL:	Gripper on a charging carriage	Special gripper on a charging carriage	Special gripper on a charging carriage

HARDENING TROLLEY LOGISTICS

Empty hardening trolleys (1-2 trolleys) are forwarded to the press with a traverser.

Once the bricks have been pressed, they are automatically removed from the press with a gripper, placed on a hardening trolley and forwarded to autoclaves with a traverser that can transport up to 6 hardening trolleys. The traverser picks up loaded hardening trolleys from the press, forwards them to the autoclaving area and loads the autoclaves.

After the autoclaving process, hardening trolleys with bricks are picked up with the traverser from the autoclaves and forwarded to the packing area. Depending on the plant structure the traverser can be equipped with a tact pusher or with a so-called locomotive. In order to clean the surface of hardening trolleys from caking there is a scraping device or a special brush used.

The entire bricks transportation during production process is of great importance. In this field Calsitec offers:

- **Traversers**
- **Hardening trolleys**
- **Transport systems**
- **Tact pusher**
- **Tackle system**
- **Electric control system with product tracking**
- **Scraping devices / brushes for hardening trolleys**

AUTOCLAVING

Green bricks are forwarded with hardening trolleys to autoclaves to be cured during 8 hours at the temperature of ca. 200°C and water vapour pressure of ca. 16 bars.

During this time the brick structure is changing. The mass made of lime, sand and water begins to interact and to form a robust structure of the CSU. During hardening process the silicic acid on the grain surface of silica sand is loosened under the influence of hot water vapour atmosphere. The silicic acid together with a binder – lime hydrate – form crystalline phases (CSH phases), that grow on sand grains and strongly bind them together.

The autoclaving section consists of:

- **Water preparation facility**
- **Steam generation unit**
- **Steam distribution unit (manually / automatically)**
- **Autoclaves with a dehydration unit**
- **Condensate recycling facility**

WASTE HEAT RECOVERY

The autoclaving process is the production step that consumes the most energy. There are usually several autoclaves used on a time-delayed basis. Waste heat recovery is used for condensate utilisation as well as for re-usage of the steam produced during an autoclaving process.

While decompressing of the autoclave the steam is used via steam distribution unit for heating of another autoclave.

The condensate can be used in the mixing plant. With a heat exchanger it is possible to recover heat from the condensate that could be used for preheating of water or heating of the building. **Take advantage of Calsitec innovative technology and make your production process more economical.**

TRANSPORT / PACKAGING

The packaging of bricks (for example on a wooden pallet with a foil) during transportation and before their usage at the building site is very essential to ensure the high quality of the product.

Packing lines of Calsitec are of modular design and could be individually customised. One module consists of pallet magazines that are used for pallet supply and are essential for an automated packaging process of sand lime bricks. Moreover pallet transport and conveying systems such as chain or roll conveyers, roll conveyers with a pushing mechanism, tray or indexing conveyers are offered.

The pallets loaded with CSUs are forwarded to the packing station. Usually a combination of vertical and horizontal strapping and packaging with stretch foil is used. The strapping ensures a safe transportation while packaging with stretch foil protects the products against weather and could also be used for advertising purposes. Furthermore a marking machine can mark the foil with additional information.

After packaging the products are brought into stock by a forklift or a crane and are ready for dispatch.

INNOVATIVE FOR HIGHEST ASPIRATIONS

Transport and conveying systems are essential not only for efficient material flow or stock keeping but primarily for automation of the production process.

That is why they become such important factors for cost and time saving and therefore for the rate of return of your company.

You need innovative components and facilities for handling, transport and packaging of sand-lime bricks? Calsitec supports you there!

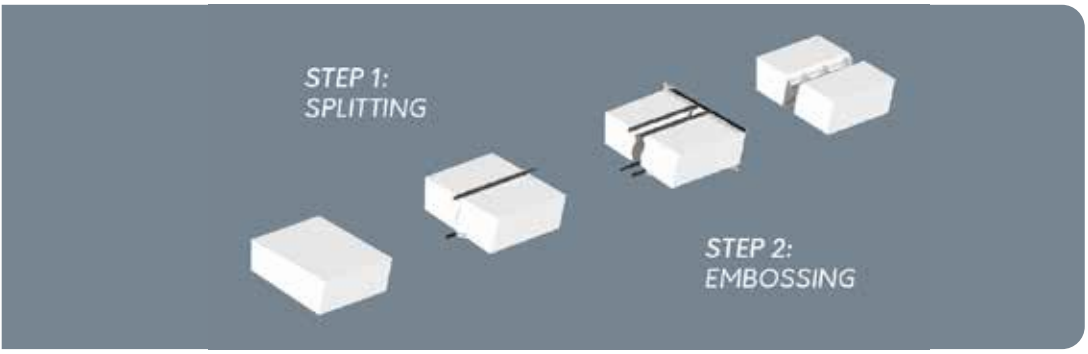
Portal systems, grouping systems, handling systems or grippers specially developed by Calsitec specialists are used to carry out precise handling operations.

INNOVATIVE – INDIVIDUAL – CUSTOMISED TO MEET YOUR REQUIREMENTS
Different conveying systems (tackle systems, pushing mechanisms, traversers) ensure reliable transportation within every area of your sand- lime brick plant. There are also chain, roll and belt conveyers used there.

COLORED AND EMBOSSED SAND-LIME BRICKS

You want to produce colored sand-lime bricks? Or to make embossed facing bricks from usual sand-lime bricks? Calsitec offers individual machines especially for these purposes.

In order to produce colored bricks according to the usual technology there is a color mixing plant supplied as a bypass. The colored sand lime bricks are used as a rule for facing brickworks. In a further production step the bricks could be additionally embossed or broken.



Innovative in every detail - Calsitec-Combi-Embosser is a combined splitting and embossing unit that performs two processing steps in one machine run. In one punching process one brick is split and at the same time two brick halves are embossed to produce a stretcher and a header at the same time.

Calsitec-Combi-Embosser processes a sand lime-brick to produce a facing brick with rustic appearance. Thanks to small place required the machine could be used as a “stand-alone” unit with manual operation or as a fully automatic production line.

In order to emboss sand-lime bricks there was Calsitec-Embosser developed. This compact unit produces up to 2,400 embossed stretchers or 1,200 embossed headers/stretchers per hour.

Varied and exact embossing patterns can be quickly and safely achieved by adjusting the operation speed. Further advantages of this machine are diverse application possibilities (as a stand alone or in-line solution) as well as simple operation.

BRICK PROCESSING

Calsitec-Impregnator - proper moisture protection

After embossing the embossed sides of a sand-lime brick, the brick must be protected against weather influence with impregnation. So the sand lime bricks go through the Calsitec-Impregnator that ensures high production quantity. Both Calsitec-Combi-Embosser and Calsitec-Embosser can be equipped with the Calsitec-Impregnator.

Great variety of products thanks to the broad range of brick saws by Calsitec.

The broad range of brick saws made by Calsitec enables sawing of a large variety of stone shapes: facing bricks, corner facing bricks, half bricks, stretchers, headers and shaped bricks.

High standards of sawing technology are offered by Calsitec with different settings and options. Format change is simply done.

Every saw offers high performance while sawing hard materials and captivates you with diverse application possibilities.

Give your sand lime bricks the final cut

Take advantages of the Calsitec-brick saws. These are:

- **High precision**
- **Simple change and long life cycle of saw blades**
- **Simple control system**
- **Manual operation possible**
- **High energy efficiency**

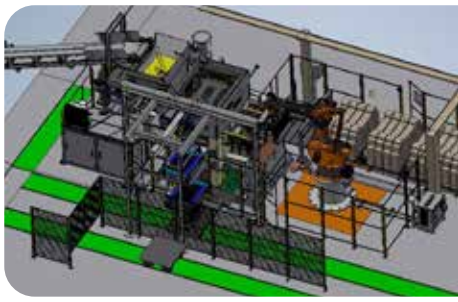
COMPETITIVE FOR THE FUTURE

Modernisation and optimisation

Do you have a plant and want to modernise it? Or want to optimise production process? Calsitec develops modular concepts for all common production technologies.

Calsitec offers approved low-priced solutions for modernisation. In such a way it is possible to improve not only the effectiveness and efficiency of a sand-lime brick plant but also the product quality.
The integration of up-to-date production lines in an existing plant is possible at any time. Optimisation could be carried out on individual basis.

Service and spare parts supply
Also after the equipment delivery we provide you with ongoing support as a reliable partner. Our team offers after sales service and consulting service worldwide. We support your personnel in all issues concerning production process with remote maintenance and of cause at your site if needed.



Calsitec also ensures flexible and efficient spare parts supply all over the world. Fast and reliable processing of enquiries and orders as well as permanent storage of important spare and wear parts in our warehouses are our strengths.

MODERNISATION

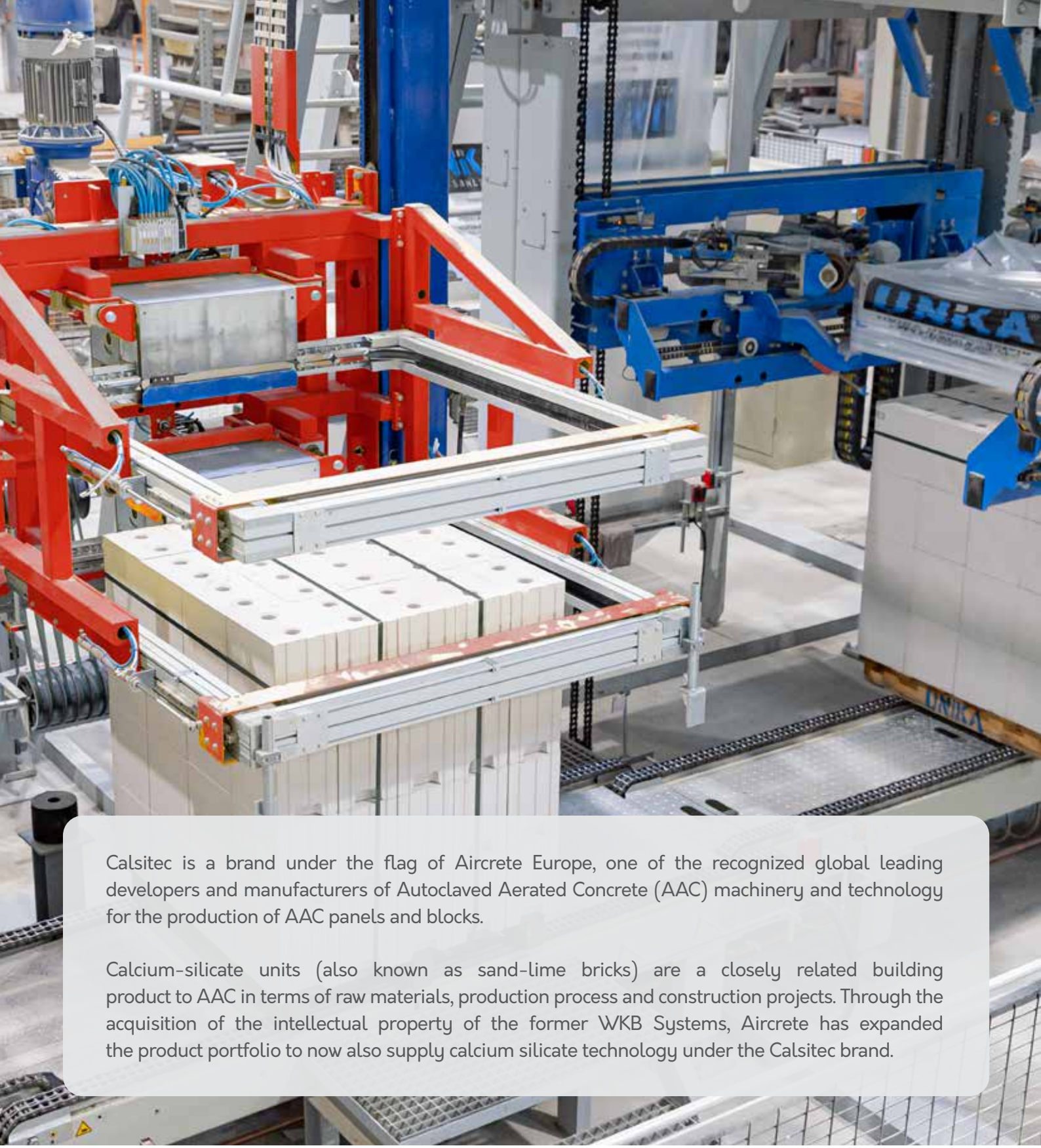
Improve your competitive advantage – now and in the future
We optimise and modernise your production – thanks to the modular design of our production lines it is possible to pay attention to every single machinery component. We are specialised in:

- **Mixing plants**
- **Hydraulic presses**
- **Hardening trolley logistics**
- **Packaging lines**
- **Brick processing**
- **Process automation**

Calsitec lines ensure the highest flexibility and quality. Thanks to the individual concepts developed according to the customer requirements there is a high customer benefit reached.

Optimisation advantages for your production:

- **Increase in the production volume**
- **Staff saving**
- **Automatisation improvement**
- **Reduction in working cycle time**
- **Improvement of quality**
- **Cost reduction as a result of usage of an existing building**



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