

Efficient after-treatment solutions for growing demand

One of the main items that operators of AAC factories continuously focus is to make their production process more efficient. Simply by keeping cost equal and increasing production output, profitability will go up, assuming no comprising of the product quality of course. With an integrated approach, Aircrete Europe fully understands the dynamics of producing AAC that goes beyond simple supply of equipment and machinery. Especially for panel production, there are additional layers of complexity on the front-end (i.e. reinforcement) and on the back-end (i.e. after-treatment). This article focuses on some of the after-treatment solutions and elaborates on a number of panel milling options to improve milling and sawing efficiency that further expands product portfolio by CNC milling.



Fig. 1: Panels as they feed into the panel pack milling unit

Advantages of profiling in white

The profiling of AAC products can be integrated in two ways in the production process: pre-autoclaving (i.e. in the “green” stage) or post-autoclaving (i.e. in the “white” stage). Traditionally profiling has been done in the green stage, however for its latest projects, Aircrete Europe has created an additional option for its clients to incorporate the profiling in the white stage. Milling in green is undoubtedly possible and profiling in green is performed with a static knife generally. When profiling in white however, higher accuracy, better quality and less damage can be achieved on the profiles.

White profiling of complete panel packs

An improvement from the existing white profiling options, where panels are profiled one by one, Aircrete Europe created a new solution that allows for the profiling of a complete pack of panels at once, with a complete range of profiling options such as tongue and groove, chamfers or any other specific shape and profiles over the full length, with high accuracy and fast cycle times.

All the AAC dust is collected and recycled back in the process with a pneumatic transportation system, leading to the separate bin in the mixing tower. In addition, in order to minimize cycle times, this system is installed between the unloading crane and the palletizing of the production process. Special Aircrete Europe conveyor solutions reconfigure the cake to obtain the final pack size and the entire pack of freshly autoclaved, unprofiled panels moves into the white pack milling unit while a movable side roller pushes the pack against the fixed side rollers (Fig 1).



Fig. 2: Fully profiled panels exiting the milling unit

The custom-designed milling shafts, which are easy to change, therefore allowing a high flexibility of the profile types, profile the panels in the pack at the top and bottom simultaneously whilst the panels are moving through (i.e. the milling cassettes are static) (Fig. 2). All milled particles and dust are sucked out during this milling process from the top and bottom, ensuring a clean process that avoids dust from getting into the atmosphere.

Features of panel pack white profiling

- Profiles the full panel pack at once: L=1000-6000 mm and W=500-800 mm
- Profiling is possible on any thickness from 50 mm onwards
- 3D profile design is custom-made for tongue & groove (interlock) and deep floor profiles
- Fast cycle time: 30-60 sec per panel pack (< 4 minutes per cake)
- High precision (notably better than any green profiling)
- Full AAC waste recycling
- Fully automatic operation

Panel pack saw for complete panel packs

Most AAC panel factories also have an after-treatment sawing solution to have the option to cut panels after autoclaving. This solution helps to create non-standard product sizes, so-called “specials” or cut away the ends of damaged panels by cutting away the breakage from panels to be able to use the product still.

As standard sawing solutions are only able to cut one panel at a time, this is a cumbersome process that requires the removal of the existing packaging and strapping, apply the fixing/treatment and re-packaging, which is all time-intensive and have negative impacts on the production cycle times. With AAC panels, in case a damage occurs during the production process, most of the time this takes place on the front or end sides of the cakes. This is a typical risk when cutting with a tilt-cake cutting technology, as the equipment here does not have a pusher to function as a wire catcher when the wires leave the cake with substantial pressure.

The panel pack saw for complete panel packs designed by Aircrete Europe cuts the edges of the full packs of panels so that damaged packs can be processed faster and easier. The process starts by placing a full damaged panel pack onto the infeed conveyor with a forklift or a crane. Rollers start to move the product through and at the desired spot a large steel blade cuts through the complete pack at once (Fig. 3). The waste is then removed into a bin, while the new “shortened” panel pack can go

directly to the stockyard (Fig. 4). In case reinforcement is exposed due to the sawing position, these ends of the reinforcement are then immediately coated with anti-corrosion coating to protect against corrosion.



Fig. 3: Damaged ends of 7 cm panel are in the process of being cut off from the full 3 m pack



Fig. 4: Overview of the exit side of the system

Features of panel pack sawing

- Saws a full panel pack at once: width up to 800 mm
- Cuts also the reinforcement
- Long-lasting design of the blade with a diamond tip
- Simple, efficient and safe operation for the fixing panel defects fast
- Automatic operation (except for loading/unloading)
- Full AAC dust extraction
- As a standalone unit, it can be placed in any panel making factory



Fig. 5: AAC cladding panels provides a durable insulation layer on outer walls with esthetical appearances

Fig. 6: Aircrete panel milling system can mill two panels at once



CNC surface routing of panels

In addition to profiling and sawing systems, another solution to enhance panels in the after-treatment section of a plant is a CNC surface router. This system is designed to create surface patterns on the AAC panels. The most common usage observed in the market is for the cladding panels (50-75 mm) in the form of façade and surfacing applications (Fig. 5). The advantage of cladding with AAC panels is having a thin but reinforced product that still remains very light. The surface design patterns can be customized with precise routing capabilities. Surface routing allows AAC producers to offer unique and high-margin cladding solutions that help them differentiate in the market. With an adjusted design, the routing of the large wall elements is also possible.

As in an Aircrete plant thinner panels can be produced (<100 mm thick panels), this system is typically incorporated in an Aircrete factory. The fully programmable CNC milling machine with four milling heads that can mill two panels at once in one cycle (Fig. 6). The infeed and outfeed can be performed either manually or automatically, while the surface milling is done fully automatically as per the pre-programmed design. For more details about the market and product applications, please refer to the “Thin panel applications and required production technology know-how” article published in AAC Worldwide vol. 04, 2019. In addition to the above-mentioned solution, Aircrete Europe also has solutions for high volume in-line solutions, where the surface milling will be positioned between the unloading and packaging line in a by-pass system.

Features of CNC surface routing

- Adds new, high-margin cladding panels to the product portfolio
- Can mill panels up to 3000 mm in length (optionally up to 6000 mm available)
- Fully customizable pattern designs
- As a standalone unit, it can be placed in any panel making factory

Sawing line for individual panels

A major advantage of the new generation Aircrete sawing lines is to cut full panel packs at once, however the sawing line for individual panels offers the flexibility to cut panels individually. In this solution, the panels are loaded to the infeed conveyor and they are automatically moved forward to the sawing position first. If panels are vertically positioned, a tilting unit turns them 90°. A gantry with a CNC sawing portal with a diamond pearl blade performs the cut indicated by the operator (cross, longitudinal or angled). Subsequently, the panel is fed out on the opposite end for pick up. Waste parts are collected either manually or automatically using a suction pad crane.



Fig. 7: Examples of cross, longitudinal and angled panel cuts

Features of individual panel sawing

- Helps AAC plants to introduce new architectural elements
- Cross, longitudinal and angled cuts of panels from 800-6000 mm in length (Fig. 7 & 8)
- Panels up to 400 mm thick can be sawed
- Extremely precise cuts
- Option to add profiling of the panel sides (e.g. tongue & groove, deep floor groove, etc.) (Fig. 9 & 10)
- Option to add vacuum suction pad crane for infeed/packaging of panels
- As a standalone unit, it can be placed in any panel making factory



Fig. 8: With the head that can move up to 90°, the sawing machine at Aircrete Mexico cuts the panels in the desired shape

Fig. 9 and Fig. 10: The infeed and outfeed of the sawing line with the dust vacuum suction unit at Aircrete Mexico plant that profiles on the sides of the panels



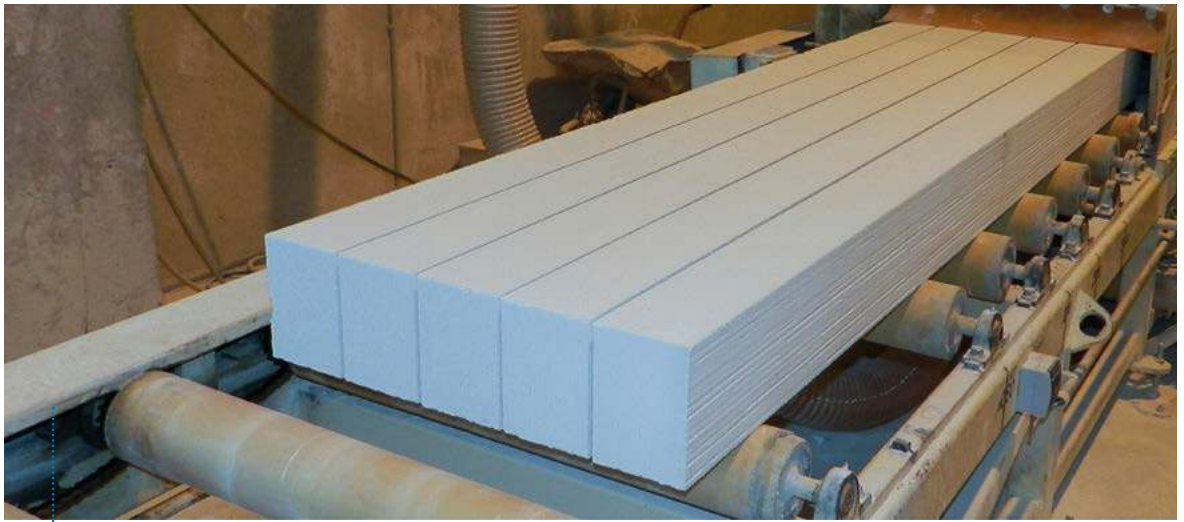


Fig. 11: A close-up view from the outfeed of the sawing line for lintels with ready, 120 mm lintels

Sawing line for making lintels from panels

Lintels play a key role as a part of an AAC building solution and the ability to make a wide range of lintels in the white stage from panels is exactly what this system is made for. Lintels are often a very standardized product and ideally, as being done in all Aircrete factories that produce panels, they should be made in the green stage in order to avoid mass sawing in the after-treatment area.

However, most AAC plants with the tilt-cake cutting technology are not able to cut lintels in the green stage and they have expressed great interest in this solution to produce lintels by cutting them out of panels in the white stage. Processing panels into lintels is relatively a straightforward and efficient operation. The panels are placed in the infeed chain conveyor by a forklift (if panels are vertically positioned a tilting unit turns them 90°). They are automatically fed forward on a conveyor through the pre-positioned longitudinal cutting blades that saw the panel in multiple lintels of the required dimensions (Fig. 11).

Aircrete Europe`s core values

Besides offering the full range of after-treatment solutions as described in this article, Aircrete Europe is a complete technology partner that provides a full range of solutions in AAC production. The company seeks to continuously exceed its customers' expectations by providing the best-in-class customized building systems and technology guidance for the global AAC industry. They support AAC plants by closely following the latest construction trends in the global markets. Through continuous investment in innovation and project technology and long-term partnerships with international architects, building authorities and civil engineers, Aircrete Europe optimizes the AAC production process and product quality, enabling AAC plants enjoy the competitive advantages of cutting-edge technology and high-quality building solutions. ●

Features of lintel sawing from panels

- Fast lintel production by cutting in white
- Easy sawing with high precision
- Fast cycle time with multiple levels of panels at once (up to 400 mm thick)
- Waste recycling in a separate big bag or connected to the mixing tower
- Customizable lintel sizes due to multiple shafts with pre-positioned blades
- As a standalone unit, it can be placed in any panel making factory



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