

# Different technologies for handling and cutting AAC cakes

There are two main recognised methods for handling and cutting a green AAC cake, both technologies developed and optimised over decades for individual finished product applications. Prior to further processing, in the tilt cake method, the cake is tilted 90° onto a cutting pallet; in the flat cake method the cake is transported flat to a grid by using a grab crane. The choice of the cutting method can have a significant impact on recipe cost and production steps.

## Transport of the cake into the cutting line

### Tilt cake cutting systems

Here the mould is tilted by 90 degrees into an upright position and placed onto a cutting pallet. Then the cutting pallet with the cake passes through the

cutting line (Fig. 1). In the tilting process, cakes with a lower hardness can be processed because the mechanical stress is reduced to a minimum.

The cutting pallet on which the cake rests during cutting is easy to clean and requires hardly any maintenance.



Fig. 1: Tilt cutting: less binders and shorter precuring times

### Flat cake cutting systems

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 on a grid.

A cake that is squeezed by a grab crane requires a higher green strength which is achieved by a higher amount of binders, mainly cement, and/or by sufficient precuring times. The quantity of binding materials and the precuring time must be adapted to the requirements for handling the cake with a grab.

### Cutting and profiling

#### Tilt cake cutting systems

After tilting the cake, 5 sides of the cake are easily accessible as the cake moves through the cutting line stages.

First stationary wires/knives profile both sides of the cake simultaneously. This ensures high accuracy. All cut-offs fall by gravity and only the top layer is sucked off by vacuum later and fed into the return slurry.



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In the second step the product thickness is cut by stationary or oscillating wires. All cutting wires can be very short, approx. 75 cm (30 in), which facilitate best possible cutting accuracy. The uniform distribution of cutting wires in a very long cutting machine reduces stress applied on the cake which is in particular important for thinner products (less than 75 mm thickness), (Fig. 3).

Finally, the block height or panel length is cut in the cross cutter. The cross cutter operates with two oscillating cutting frames. The wire tension is kept constant, thus providing cutting accuracy and extended wire life.

The accessible sides of the cake allow profiling of grip holes for blocks when required.



Fig. 2: Easy and precise profiling in tilt cutting systems



Fig. 3: Uniform distribution of cutting wires reduces stress during thickness cutting



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

## Flat cake cutting systems

In flat cake cutting systems profiling is usually done during the transport of the cake from the mould into the cutting line or after autoclaving using milling machines. In the green stage, the cake is still hanging in the grab crane and knives carry out the profiling from underneath the cake. The top part of the cake is profiled later during the cutting process.

Then the cake is placed in the cross-cutting section, where oscillating wires cut the block height or panel length.

Before the thickness cut, the cutting gaps caused by the cross cutter will be closed. This is important to prevent the wires of the thickness cutter from escaping into these gaps and causing damage. The cake is sliding on the grid during this process step.

Finally, the top part of the cake can be profiled with knives. Cut-offs are collected by vacuum from the surface of the cake.

The grid on which the cake rests during the entire process (cutting and autoclaving) comprises of thin lamellas which have to be well maintained to avoid collision with the wires of the thickness cutter.

Both technologies presented here for handling and cutting autoclaved aerated concrete cakes have their advantages for certain products. From a historical perspective, both technologies have evolved and been optimised over the decades.



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