

Avermann Betonfertigteiltechnik GmbH & Co. KG, 49078 Osnabrück, Germany

# Expanding the system for manufacturing solid and sandwich walls at ConFac A/S in Denmark

ConFac began producing wall and façade elements on a greenfield site in 2008. Their concrete production facility in Randers, Denmark, was set up using a new type of manufacturing concept. The possibility of expanding the system had already been taken into consideration at the planning stage. Given the thoroughly positive developments in business and growth in demand for high-class precast components, the partners decided on doubling their production capacity. For the expansion in 2018 as on the previous occasion, Avermann, a German systems manufacturer, was contracted to manufacture, supply and commission the production line.

ConFac A/S produces a whole variety of flat precast concrete components. Their portfolio ranges from simple solid walls to sophisticated façade elements using a sandwich construction method right up to exacting special components. The production line works to capacity manufacturing precast mainly for residential construction. However, its pallet dimensions also permit the production of large-format wall elements for industrial construction purposes.

Although the first years were definitely a challenge for the young enterprise – shortly after the beginning of 2008, ConFac also had to deal with the effects of the global economic

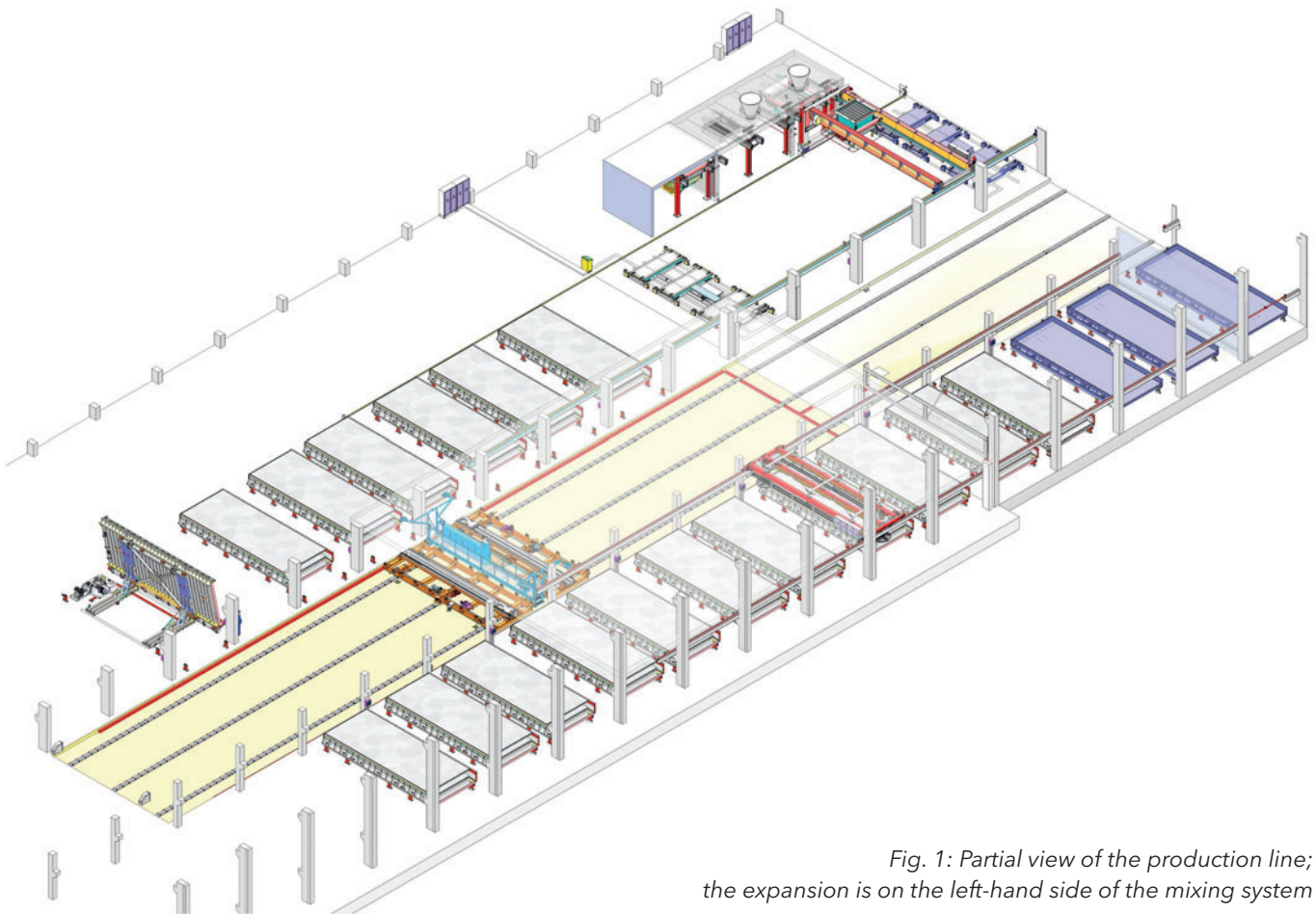


Fig. 1: Partial view of the production line; the expansion is on the left-hand side of the mixing system



Fig. 2: View of the two production halls from above the open-air storage area; the central mixing system is in the middle

crisis - the company enjoyed stability in the following years and became an established name in the sector. There was growth in returns on sales from year to year. However, the manufacturing capacity of the existing system was becoming insufficient with increasing regularity.

Initial thoughts of integrating a rack servicing machine with curing chambers and additional pallets into the present system were subsequently discarded. This would have indeed meant that system capacity could have been enhanced but, for this idea, there was simply a lack of workplaces that would have allowed work in parallel at several stations.

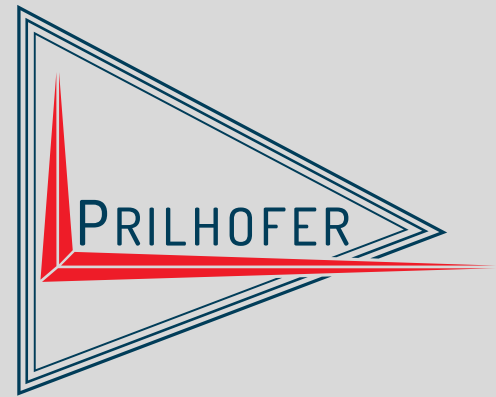
In the course of the years, ConFac became increasingly specialised in manufacturing high-class façade elements. This assures their company a competitive edge as there are only a few firms in Scandinavia who can manufacture large-format precast in very high quality at a price acceptable to the market.

And so the four owners, Hans Verner Lind, Frank Laursen, Peter Adamsen and Erling Holm, took the decision of doubling the production equipment so that the new system expansion should be a complete mirror of the old. The expansion to the system also includes a second central transfer platform and other workstations so that manufacturing can continue in parallel on two production systems operating independently of each other.

The existing mixing system is the only central station supplying both systems with fresh concrete.

### Planning / Construction Stage

The essential task at hand was to enhance production capacity by mirroring the present system. From the outset, it was clear that pallet dimensions must remain identical and that machines, such as concrete spreader, vibration compactor, tilting station, power trowel smoothing devices and central transfer platform, could be optimised in the planning process but had to be compatible with the old equipment.



## PRECAST CONCRETE EXPERTS

### MASTER PLANNING

- > General planner for the factory
- > Feasibility studies & products
- > Overall Investment costs
- > Factory layouts

### PLANT TECHNOLOGY

- > Optimising existing production plants
- > Customised production & processes
- > Automation & efficiency

### COMPANY DEVELOPMENT

- > Go-to-market strategy
- > Product development
- > Know-how transfer





Fig. 3: Pallet transport using a central transfer platform

The neighbouring plot of land next to the existing production system - there was a buy option right from the start - had already been purchased and connected up several years ago. Detailed planning was undertaken in the spring of 2017. The contract was subsequently awarded to Avermann to supply the system expansion in a package with their sub-contractor RIB SAA for the process and circulation system control unit. The construction work, including earth-moving, making the foundations and erecting the halls etc., was carried out in-house by ConFac from the summer onwards so that installing

the system could begin in January 2018. However, commissioning the system was carried out in stages and under special conditions as ConFac continued to operate their production line whilst the system was assembled.

#### System concept with production equipment

As opposed to standardised pallet circulation systems, in this system concept all transport processes are carried out solely using a central transfer platform (CTP) set up for transporting

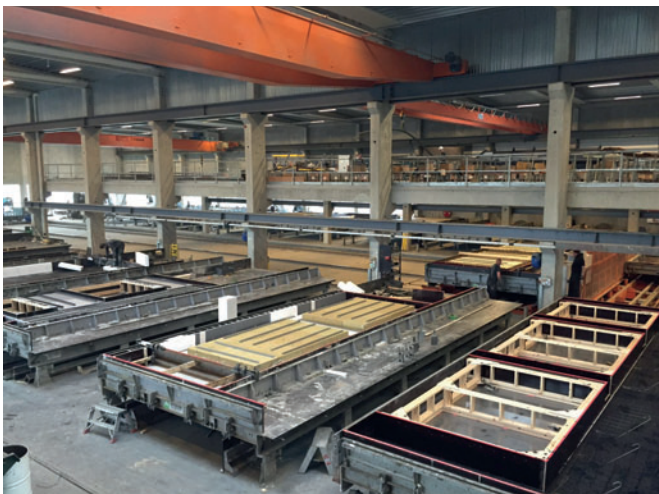


Fig. 4: Workstations for setting up formwork



Fig. 5: Concreting station with concrete spreader and Avermann vibration compactor



two loaded pallets at a time. As a general rule, only one pallet is moved at a time and is exchanged for another at a workstation. This makes for extremely short changeover times without long waiting periods. Work can begin again immediately at each workplace.

Setting up formwork is usually carried out at the upper workplaces (on the mixer side). The magnet formwork and installation components are stored at this point as well as Betoplan panels, which are cut to requirements.

By way of contrast, the reinforcement is inserted at a total of three workplaces on the opposite side of the CTP. Cages and meshes prepared beforehand are installed by means of a hall crane directly from the reinforcement table onto the pallets using and then connected up with each other there.

Once the preparatory work has been completed, the pallets then travel to the concreting points. Concreting is possible at several stations; for practical reasons it nonetheless mostly takes place at one of the two compacting stations. The concreting and compacting stations have been set up with optimised routing in the immediate vicinity of the mixing station. Concrete is filled directly under the Haarup mixer into one of a total of three concrete spreaders. It is then transported with both semi-portal travelling frames and spread over a pallet. With sandwich walls (façades), the facing concrete layer is produced with coloured or washed-out concrete according to the appearance desired; grey concrete is generally utilised for the load-bearing layer. All machine operations are remotely radio-controlled.

The concrete can be compacted at either low or high frequency, or in a combination of both, e.g. for washed-out concrete components.



Abb. 6: Upper side post-treatment with power trowels

After the concreting/compacting process, the pallets travel to one of the many parking positions on the opposite side to the mixer.

Here is where another appreciable advantage of this system concept comes to the fore – “parking places” available in sufficient quantity. Pallets destined to be smoothed can remain at these points for as long as needed for the concrete to set and be ready for the power trowels. According to the quality specified, the smoothing process with a disc plate can be followed some time afterwards by polishing the surface using four power float blades.

The expanded system is now set up for manufacturing a total of 32 pallets measuring 10.5 x 4.2/4.5 m with a load-bearing



**iTWO Smart Production**  
Intelligent Software Solutions  
for Prefabrication and  
Modular Construction

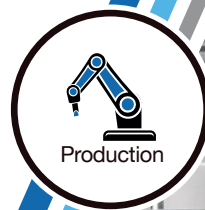
**RIB SAA Software Engineering GmbH**  
Gudrunstraße 184/4  
1100 Vienna, Austria

www.rib-saa.com  
T: +43 1 641 42 47-0  
E: office@saa.at

**bauma**

APRIL 8–14, 2019, MUNICH

→ VISIT US!  
B 1.101



capacity of 7.5 kN/m<sup>2</sup>. Edging formwork infinitely variable in height in conjunction with facing concrete formwork permits elements ranging in thickness between 150...700 mm to be manufactured! All pallets can be exchanged between one production line and the other.

The major advantage with this concept is its great flexibility. Although it is a pallet circulation system, formwork for solid, sandwich and special components can be set up and reinforcement installed in parallel and without any mutual interference independently of the actual scope of work and its duration.

**System control unit**

The circulation and process control unit was supplied and commissioned in its entirety by RIB SAA Software Engineering GmbH from Austria. A sensible mix of manually managed processes in conjunction with semi-automated sequences ensures it operates efficiently. System functionality combined with smooth operations is an essential prerequisite for efficiency and quality management. The control unit's complete remote maintenance is also a point that should not be underestimated. Any errors that might occur can be diagnosed and remedied via internet.

**ConFac - a model for success**

It is indeed remarkable how one Danish company, ConFac A/S, has developed into one of the top-notch suppliers in Scandinavia within a period of only ten years. However, it was part of their strategy right from the outset to erect a factory in its current size. The expansion has led to 40 new employees being engaged so that a staff of more than 100 persons is now involved in this model for success.

The basis for this is a company culture that is exemplary in every way. All employees are at the same time co-owners and share in their company's success.



Fig. 7: The owners of ConFac (from left): Hans Verner Lind, Frank Laursen, Peter Adamsen and Erling Holm

**Summary and outlook**

Estimations of the demand for high-quality precast concrete components of widely varying types are thoroughly positive for the coming years.

The strong point of the expanded pallet rotation system is particularly its great flexibility, as e.g. in manufacturing construction components with highly varied processing times in parallel. Experience has shown that conventional pallet circulation systems reach their limits at this point.

ConFac possesses an extremely efficient multi-functional system for manufacturing solid, sandwich and special elements. The expansion was handed over to ConFac at the beginning of April 2018 - on time and exactly ten years after commissioning the first system. ■

**FURTHER INFORMATION**

**CONFAC**  
funktionel og funky beton

ConFac A/S  
Frederiksdalvej 16  
8940 Randers, Denmark  
T +45 8711 1000  
post@confac.dk  
www.confac.dk

 **Avermann**

Avermann Betonfertigteiletechnik GmbH & Co. KG  
Lengericher Landstraße 35  
49078 Osnabrück, Germany  
T +49 5405 5050  
info@avermann.de  
www.avermann.de



 **RIB SAA**  
running together

RIB SAA Software Engineering GmbH  
Gudrunstraße 184/4  
1100 Vienna, Austria  
T +43 1641 42470  
office@saa.at  
www.saa.at

