

Quadra, 74130 Contamine-sur-Arve, France

## Fully Automated mould change in a block machine: new patented system

To meet the requirements of the market, a key concern for the concrete manufacturer is to succeed in reconciling flexibility, productivity and safety, while offering an ever-larger range of high-quality products.

It is known that manufacturing plants produce according to their stock and the specific orders they receive. However, quantities and type of product are increasingly variable. In order to react to their customers' wishes, concrete manufacturers have to change their production several times during a shift. However, this operation has a big impact on the production. On the one hand, the overall manufacturing process is affected in that the production changeover involves a production shutdown which adversely affects the rate of production. On the other hand, this operation affects the labour force during the handling of moulds, exposing them to hazards and frequent work-related accidents.

The implications for productivity and safety are therefore significant and are always carefully considered since the number of changeovers is a necessary consequence of the incoming orders.

To that end, Quadra, manufacturer of turn-key plant for the concrete industry, has released a patented solution in order to address and overcome the constraints caused by handling moulds during production changeover.

Quadra has taken on the challenge of fully automating this operation. The first tailored automatic stacker crane has been set up in the Plattard factory with which Quadra has been in close collaboration for many years. This automatic device allows many production changeovers per shift within only 5 minutes.

### Implementation

The mould rack storage has been set up in a closed area. A special route has been created from the rack storage area to the block-machine, enabling the stacker crane to move between both areas.

The stacker crane moves and handles moulds from the rack to the block-machine and from the block-machine to the rack while production is still in operation.

Consequently, this transfer time does not affect the production since it is not stopped. A space between the block-machine and the face-mix unit has been implemented to enable the stacker crane to come between the machines to enable moving the moulds directly from and to the block machine.

Regarding automation of the operation, an accurate referencing of the mould and the tamper head is recorded. In addition,



*Automated mould rack storage*

adjustment of the tamper head, the mould and the drawer table of the press enables accurate and automated positioning. As for the manufacturing recipes by product type, they are automatically incremented.

To finish, a washing station has been set up outside of the building. Entirely automatic, it enables to wash moulds without any manual handling. A special system allows retrieving used water in order to comply with sustainable development procedure and to preserve the environment. This patented system does not involve any mold handling by forklift.

**Operating**

The operator uses the control screen to select the mould required for the next production. Without interrupting the current production, the automatic stacker crane withdraws the required mould from the rack and transfers it to the block-machine area for placing it within a temporary rack situated close to the machine.

As soon as the production is ready, the stacker crane moves between the block



*Depositing the mould close to the block machine*



Manufacturer of equipment for the concrete industry

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*Stacker crane ready to incorporate the new mould*

machine and the face-mix unit in order to withdraw from the block machine the mould to be changed. The stacker crane places this mould near the block machine, and then installs the new one. The adjustment and the securing of the pestle and the

mould is automated. When the face-mix unit is ready, the production can start again. The entire change cycle lasts only 5 minutes.

When the machine has resumed production, the stacker crane retrieves the mould

which has been used, and takes it to the washing station. After the washing operation, the mould is placed in the storage rack to wait for further use.

**Benefits: quick and safe production changeover**

Automating of the production changeover is a solution to meet the demands of the market, while also improving working conditions. Thanks to the transfer and the handling done by the stacker crane during production, manufacturing has to be stopped for only 5 minutes. The loss of production is therefore minimized, and enables the manufacturer to switch production more frequently, enabling it to be flexible and varied.

In addition, the automation of this operation is beneficial for the health and safety of the operators. Indeed, no manual intervention is required. The operator is now in charge of controlling the stacker crane for the whole operation. No handling operations nor moving around in the block-machine area is involved. The number of work-related accidents is therefore decreased and whole situation is improved. Now the operator's job is to watch and oversee the oper-



*Production changeover operated by the stacker crane*



*Rack close to the block machine*



*Washing station set up outside of the building*

ation from the control cab. The control screen shows all the mould positions within the racks and displays the number of cycles that the moulds have undergone, which facilitates mould life-cycle management.

### Conclusion

Quadra has met a major challenge and achieved a great technical advance. The automation and the precision of the handling of equipment weighing more than 4 tonnes had not been attempted before.

This automatic system responds to current concerns effectively and efficiently. Production changeover can now be more frequent while also benefiting from reduced downtime. The implications in terms of stock are favourable since the stock of manufactured product decreases thanks to production at the right time.

Finally, the safety of the operators is maintained and the investment quickly pays for itself. ■

### FURTHER INFORMATION



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