

Quadra, 74130 Contamine-sur-Arve, France

# Fabemi invests in a new model of vibrating press with high production capacity, set-up in their plant based near Lyon in France

Created in 1961, Fabemi is a family-owned company based in Donzère, in South of France. In investing in equipment of high technology since their creation, the company managed to develop new products around its core business, achieving their current and valuable reputation. With more than 14 production sites throughout France, and more than 500 employees, the Groupe Fabemi is a leading player in the building materials industry. As a proper partner through its numerous activities, Fabemi supplies technical and aesthetical products, and provides its clients with customized and innovative services. The quality and the manufacturing excellence are the particular strengths of the group that focus on using the best manufacturing technologies. Following the realisation of many projects with the manufacturer of equipment Quadra, Fabemi renewed its confidence in his partner with the modernisation of its plant of high capacity of production. The technical challenge perfectly taken up by Quadra was the integration of a new generation vibrating press within an existing plant, in reusing some equipment.

The thorough study and in-depth analyse carried out by Quadra enabled the new block machine to manufacture a volume of production that was never reached, without being disturbed or slowed by the other equipment. In order to make use of the performances of the block machine, Quadra has recommended to replace the traditional palletising equipment with a modern equipment, fully automated and robotized, and removing all the hydraulic functions. This new cubing line consists of three robots operating simultaneously, following the cycle time of the vibrating press, within operating condition combining precision, speed, flexibility, and reliability.

**Vibrating press: High performance Quadra14HP with high surface of moulding (moulding pallet 1550 x 1250 mm): productive plant with high operational efficiency**

The first major challenge for Quadra was to set up the new vibrating press within an existing site, and where the previous machine (provided by another supplier) was located.

The existing civil engineering was designed with a pit, as well as reinforcements steel frame in the ground. The vibrating

press Quadra14HP was set up without any civil engineering works modification. This block machine, specially designed according to the Fabemi's requirements, is oversized and overdesigned. The feet of the machine carrying the impressive weight (40 tonnes) are rationally positioned and allocated.

Mounted on anti-vibration feet, the frame (large and heavy one-piece steel structure) is protected from the vibrating solicitations and allows no vibration to the ground. Thanks to the lateral position of the motors, no specific ground is required for setting-up the machine.



*The vibrating press Quadra14HP is equipped with all technologies that built the reputation of Quadra. The production unit type « HP » includes several patented systems and is the most productive and efficient range of machine designed by Quadra.*

This lateral position of the motors also allows direct and are protected from the vibrating effects and the concrete projections. Therefore, all the conditions are met to ensure the reliability and the longevity of the equipment. Finally, the elevated and ventilated architecture of the machine allows easy cleaning and maintenance operations.

Using plastic pallets of dimension 1550 x 1250 x 50 mm, this big board block machine enables the groupe Fabemi to manufacture very high production output, within very short cycle time. This machine allows versatile production (blocks, kerbstones), with a production capacity of:

- 14 blocks of 20 x 20 x 50 cm per cycle, so one block every second.
- 21 blocks of 20 x 20 x 40 cm per cycle, so one block every 0.66 second.

This vibrating press of new generation was designed to implement all the accelerometers and laser cells that enable to adjust the manufacturing and vibrating settings in order to optimise the machine operation. During the commissioning, these sensors define with accuracy the most adapted settings, in order to ensure high quality products with short cycle time and minimizing the demands of the machine. Some adjustments are improving the vibrating performances and define recipes that ensure a correct vibrating behaviour and products of quality.

The commissioning is a key operation, that's why Quadra develops advanced scientific and technological tools. Until now, the commissioning of the equipment and the operating settings of the machine were based on empiricism and intuitive adjustments. This empiricism step remains mandatory, but a scientific and technological approach must be added.

Committed in a research and development approach applied to the vibration of the block machine, Quadra has developed an interface that results in modelling the machine cycles. As part of the use and the follow up plant, all the operating data are recorded. This tool provides a periodic monitoring and archive the optimum settings and offers a quick diagnostic regarding the components to be replaced during the life cycle of the machine.

The vibrating press Quadra14HP is equipped with all technologies that built the reputation of Quadra. The production units type « HP » (meaning High Performance) include several patented system. This is the most productive and efficient range of machine designed by Quadra. The expertise in terms of vibrating and mechanical development is combined with latest technological progress and make this range of machine stand out with unique technical features, manufacturing conditions allowing the perfect control of the dimensional features (height, weight, density, and strength), whilst providing consistent cycle of production.

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**QUADRA**  
40 route de Findrol - 74130 Contamine-sur-Arve / France -  
Tel. +33 (0)4 50 03 92 21 / info@quadra-concrete.com

**PUK Limited - www.pukservices.co.uk**  
Unit 1, Stratford Agri - Park - Clifford Chambers -  
Stratford upon Avon - Warwickshire CV37 8LP  
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### Optimal manufacturing conditions ensuring short cycle time and high quality products: patented system

The modular vibrating features designed by Quadra are patented and provide a dynamic compaction operation involving fast and consistent filling, as well as constant density throughout the product's height. The Quadra14HP is equipped with a pre-vibration system with « adjustable force and frequency ». The vibration settings between the front and the rear of the mould are different which optimise the density and the consistency of the products, whilst achieving a more efficient cycle time.

This vibrating press is also equipped with retractable static bars. During the vibrating cycle, the retractable static bars are operating to provide:

- Shorter vibrating cycle time: The static bars are held in low position during the filling process. This leads to a maximal vibrating amplitude of the mold, a shorter cycle time, and an efficient filling.
- Products height accuracy calibration.
- Lower solicitations transmitted to the mold, and reduction of the mold wear.

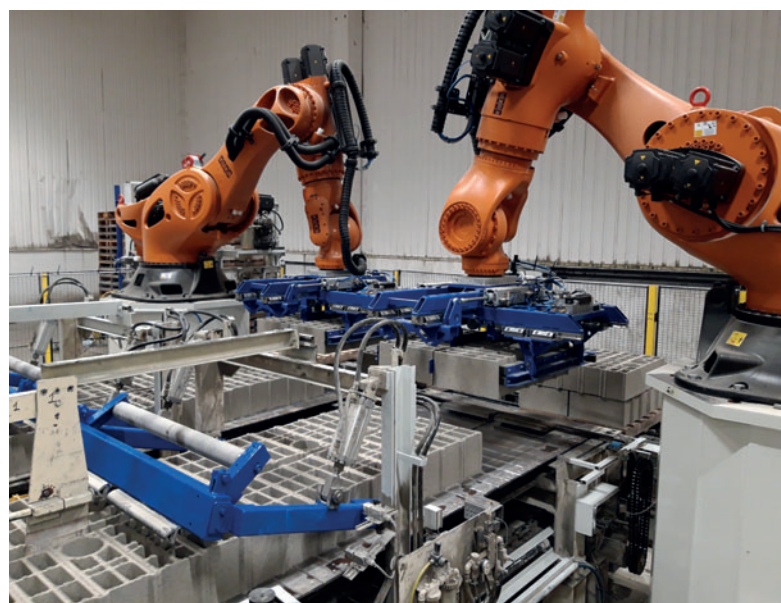
According to Quadra, this range of vibrating press guarantees a height accuracy of less than 1 mm. To achieve this accuracy calibration, the stop in the lowest position of the tamper head is made on mechanical stops. When the tamper head reaches the mechanical stop, the final vibration is completed, and the height of the product is calibrated. The height modification of the mechanical stops is made by a vertical movement ordered directly from the control desk. As no manual operation is needed, the adjustment of the height of the finished product is immediate.

Finally, this vibrating press is equipped with a fast and easy mold changeover that enables to increase significantly the production, to reduce the setting times and to optimise the machine operation.

### Cubing robots with high output: speed, reliability, quality of the packaging (one pallet/minute)

The cubing line has been fully robotised, and equipped with three robots Kuka, and two selecting conveyors. The first robot loads the products from the molding pallets, and places them alternatively on both selecting conveyors. These products are then accumulated, separated, and picked up by the two other robots located at each end of both conveyors. These robots are equipped with two different clamps that are designed, developed and manufactured by Quadra: one 4-side pneumatic clamp that grabs all kind of products with accuracy, speed and softness; and the other clamp with integrated turning-device that is perfectly adapted with the handling needs of the group Fabemi. The change between both clamps is a very easy operation that takes only 10 minutes. Both robots move the products from the selecting conveyor at which they are connected and makes a pallet.

The robots are adapting to all type of products, and the clamps are designed to handle heavy loads. A continuous control of the position of the clamp results in very high rates, and accurate products placement. The robots are commissioned with a control software that is integrated within the Quadra's interface. The recipe settings are adjustable from the control desk. The operator indicates the number of layers, the position of the product on the pallet, the placement and the number of products on each layer. As Quadra designs and integrates the automation programs within the interface, the software is adapted and updated to follow the manufacturing evolutions of their clients.



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Quadra provides its clients with a user-friendly, interactive and intuitive platform.

### « Enhanced » Service Client

Quadra has always invested to follow and assist its clients during the use of their equipment. The group Fabemi benefits from a high-quality customer service, ensured by skilled technicians. The remote maintenance allows access to all machine settings and provides effective and quick answers to operators.

The visio-maintenance service is also provided to Quadra's clients in order to assist them in real time during the adjustment or the troubleshooting of their equipment. This service of "augmented reality" makes easier the discussions between the operators and the technicians and allows more effective assistance.

Recently, Quadra has enhanced its service and provide to its clients with a user-friendly, interactive and intuitive platform that enables them to quickly and easily forward their requests (information request, quotation request, and incident report). They have also the possibility to display and download their online spare-part catalogue, and all the technical documentation related to their equipment, as well as user manual and learning tutorials.

### Conclusion

The commissioning of one of the most modern plant shows the dynamism of the Group Fabemi by implementing this performing equipment and accessing to innovative technologies. The long-term partnership between both Quadra and Fabemi has once again paid off. The constructive dialogue and the communication between both partners were highly positive and key for the project success.

This vibrating press provides the largest format never built before. This is a first realisation for Quadra, and the direct results

in terms of production rates, cycle time, and product quality are very satisfying and open up good perspective for the future. This new generation of machine provides high rates, whilst ensuring high flexibility, high adaptability, and incontestable ease of operation. ■

### FURTHER INFORMATION



Quadra  
40, route de Findrol  
74130 Contamine-sur-Arve, France  
T +33 45003 9221, F +33 45003 6997  
[info@quadra-concrete.com](mailto:info@quadra-concrete.com), [www.quadra-concrete.com](http://www.quadra-concrete.com)



**Fabemi**

Groupe Fabemi  
320 RN7 - Le Pont Double, 26290 Donzere, France  
T +33 475 965030, F +33 475 960811  
[www.fabemi.fr](http://www.fabemi.fr)



Kuka Aktiengesellschaft  
Zugspitzstraße 140, 86165 Augsburg, Germany  
T +49 821 79750, F +49 821 7975252  
[kontakt@kuka.com](mailto:kontakt@kuka.com), [www.kuka.com](http://www.kuka.com)