Quadra, 74130 Contamine-sur-Arve, France

Commissioning of a grinding unit at Garandeau Group's concrete block manufacturing site

Based in Cognac in France for over 150 years, the Garandeau Group plays an important role in the Charente economy. Today, with over 680 employees, it also has a presence in Charente Maritime, Vienne, Haute Vienne, Gironde and Dordogne. A leading supplier to the regional construction industry, the Group is developing its activities in the production of natural and recycled aggregates, precast concrete, ready-mixed concrete and building materials stores. With more than 50 sites (including 20 quarries, 11 ready mix plants and 19 building materials stores), the Garandeau Group's local network in Northern Nouvelle-Aquitaine enables strong synergies between its activities and enhanced efficiency in serving its customers, whether they are private, contractors, professionals or local authorities.

The company was founded by Pierre Daunizeau, a plaster manufacturer from Deux Sèvres. He acquired the Champblanc gypsum quarry in 1869 and soon built a plaster factory there.

The family business modernised at the beginning of the 20th century with the arrival of the railway, which connected the plaster factory directly to Cognac station. In the 1920s, the "Garandeau Frères" plaster factory shipped 700,000 bags of "Cognac plaster" per year throughout Western France.

Today, the company is run by the founder's descendants; this is the sixth generation, several of whom work in different field and activities within the company. Laurent Richaud (CEO) and Tanguy Chauvière Le Drian (Managing Director) are members of this sixth generation. But the family nature of the company is also reflected in its attachment to the human values that have always driven it and in its ambition to remain independent and sustainable.

As part of its CSR policy and continuous improvement approach, the Garandeau Group places customer service, innovation and sustainable purchasing at the heart of its commitments. It has drawn up a Responsible Purchasing Charter which lists its commitments and expectations towards its suppliers and subcontractors.

Quadra: the choice of a partner that shares the same values

In 2009, the Garandeau Group inaugurated the Pierre Soucaret precast concrete plant at its Châteauneuf site. Fully automated, it can achieve an annual production of six million blocks.

The environmental integration of the plant was one of the Group's priorities:

- Fully enclosed installation (to prevent noise emissions and dust dispersion),
- Plant located on the limestone quarry site itself (reducing truck traffic),
- Use of locally produced cement,
- Recovery and treatment of rainwater before discharge into the natural environment,
- Entirely natural drying process requiring no heat input.

Quadra, a French manufacturer of automated equipment for the concrete industry, has been selected to supply the production tool for the plant, a Q10 HP vibrating press.

The entire plant has been designed to meet the Group's productivity and quality requirements:

- Manufacture of blocks on steal boards to guarantee the dimensional regularity of the products,
- Height control ensured by a laser measurement that analyses and detects height deviations bigger than 2 mm (manufacturing tolerance in block height of +1/4 mm),
- Reversed palletising: the block is ready for use, saving time on construction sites and reducing physical strain,
- Drying area automatically fed with wet products. A programme manages the removal of dry blocks by finger car, which are then palletised.

At that time, Quadra's design and R&D teams were working on developing their first range of concrete block grinding

machines. As a pioneer in the grinding market, the French manufacturer now offers a comprehensive and high-performance range of fully integrated grinding machines with cycle times shorter than those of presses. Currently, around fifty machines are in service in Europe and around the world.

The grinded block, a sustainable solution for reducing the carbon footprint of building systems

The machining of conventional or formwork concrete blocks, including on two sides (patented system), is carried out in line between the descender and palletising. The grinding cycle time (12 to 16 seconds) is compatible with the speed of the block machines, without slowing them down. The machines are soundproofed and equipped with an efficient and effective dust extraction system. With a machining accuracy of less than 0.3 mm, the grinded blocks can then be assembled using a very thin horizontal adhesive joint, replacing mortar.

In addition to their mechanical and thermal advantages, grinded blocks have a reduced environmental footprint.

On the one hand, adhesive installation offers optimised environmental performance compared to masonry installation: construction sites are faster (30% increase in productivity), cleaner (less cluttered workstations, less rubble, no mortar spillage, better waste management) and quieter (no concrete mixers). This installation system can generate up to 90% water savings on site and 40% fewer lorry trips.

Furthermore, adhesive replaces masonry mortar, the manufacture of which generates high CO_2 emissions. Finally, the insertion of mineral foam into the grinded block increases its fire resistance and its acoustic and thermal insulation capabilities.

The automated grinding and palletising system at the Châteauneuf site

The Garandeau Group's decision to purchase the grinding machine for its concrete prefabrication plant was made in Spring 2024. Designed and installed by Quadra, it was commissioned in January 2025.

The concrete block grinding and palletising unit at the Châteauneuf site combines cutting-edge technologies in robotics, machining and industrial automation. Designed to optimise productivity, it ensures both precision machining of the blocks and smooth handling on the production lines. The system is based on a Kuka KR 700 PA robot, a 4-axis model capable of handling loads of up to 700 kg, equipped with a removable quick-release pneumatic clamp. Two operating

The robot operates in two modes: conventional palletising or direct loading onto the grinding machine conveyor in tracking mode.

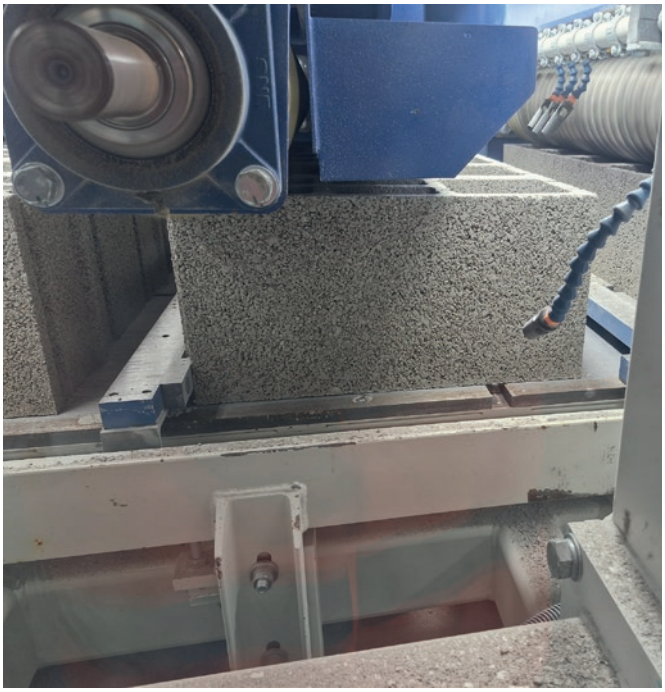
modes are available: conventional palletising or direct loading onto the grinding machine conveyor in tracking mode.

The palletising system relies on several reused materials, including the shipping pallet buffer, the full pallet pusher, the pallet conveyor and the light safety barriers.

The concrete block grinding machine supplied by Quadra is well known for its machine tool-inspired design, which makes maintenance easier and provides excellent accessibility. Dust and pollution control is optimised thanks to a high-performance extraction system. The blocks, with a height of between 170 and 300 mm, are machined on the upper face with a height tolerance of ±0.3 mm. The drying time before grinding, which is between 24 and 48 hours, determines the machining speed and the quality of the result.

The grinding equipment comprises four independent modules: a diamond roller roughing module, two diamond tooth roughing modules and a finishing module. Each module is individually adjustable on slides to ensure rigidity and precision. A motorised conveyor with variable speed drives the blocks without damaging their edges. The cutting depths are adjustable with an accuracy of one hundredth of a millimetre, thanks to servo motor reducers and ball screws. The machining rollers are driven by motors positioned on one side of the machine for simplified maintenance.

The upper surface of the blocks is cleaned using a combination of brushing, blowing and suction. The brush is mounted on an electrically adjustable rocker arm, while the blowing ramp has adjustable nozzles powered by compressed air. An upper cover allows dust to be extracted via a centralised suction system.



Machining of blocks on the upper face with a height tolerance of ±0.3 mm.

The entire grinding machine is protected by an independent soundproof cover, designed to reduce noise and facilitate access. Fine particles produced during machining are collected by a system of metal sheets inclined towards the rear of the conveyor, ensuring a clean and safe working environment.

The quality control system is continuously integrated by sampling and laser measurement directly at the grinding machine conveyor. When the operator requests a sample, the robot places a stack of blocks on a table before continuing its cycle. The operator can then check the height of the blocks and thus respond in real time to the current standards for regular product height control.

The suction unit is equipped with a dust collector with polypropylene filter cartridges that are automatically cleaned by pneumatic cleaning. The system incorporates two continuous discharge rotary valves, ensuring efficient extraction of residues. The entire unit is soundproofed to ensure optimal acoustic comfort on the production site.

At the exit of the grinded machine, a 4-axis Kuka palletising robot handles the grinded blocks. Its turning clamp, designed, developed and manufactured by Quadra, facilitates transfer between the conveyor and pallets. The entire system is supervised from a control panel incorporating a Schneider

Quadra grinding machine: protected by an independent soundproof cover, designed to reduce noise and facilitate access.

Palletising robot at the grinding machine conveyor to cub the grinded blocks.

High-quality concrete blocks for optimised productivity and working conditions.

PLC, frequency converters and a touch screen for adjusting and viewing machining parameters. Production recipes can be saved for different types of blocks, ensuring high flexibility and complete traceability.

This integrated grinding and palletising system designed and installed by Quadra illustrates the convergence between industrial performance and intelligent automation. Thanks to the precision of the grinding machine, the efficiency of the dust extraction system and the flexibility of the palletising robot, the system guarantees the production of high-quality concrete blocks while optimising productivity and working conditions.

An example of its innovation and R&D policy, the range of grinding machines designed, developed and manufactured by Quadra reflects the French family-owned company's ability to innovate and anticipate developments in the construction market. ■

FURTHER INFORMATION

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