

Quadra, 74130 Contamine-sur-Arve, France

Reference turnkey plant in Saudi Arabia: a versatile, multi-purpose and multi-product solution

The company Steeco, based in Riyadh, is currently managed by Suliman Al-Turki and has managed to achieve a strong positioning in the pre-cast industry in Saudi Arabia. Renowned for combining high quality product and regular product innovation, this manufacturer has experienced an exponential growth through continued expansion of its product line. As innovative manufacturer, Steeco regularly invests in its production equipment in view of enhancing its manufacturing process as well as launching new product on the construction and landscaping market in constantly evolving. Steeco manufactures concrete blocks, paving stones and kerbstones within multiple format and color. This company has solicited for the first time the equipment manufacturer Quadra in 2010. Equipped with a basic mobile machine at this time, Steeco makes a first step by commissioning an automatic production line including an efficient block machine type Q6. Fully satisfied with the production outputs, and convinced in the reliability and the performance of the equipment provided by the french leader in the manufacturing of concrete production equipment, Steeco further develops its influence and makes a new bold decision by entrusting once again Quadra for the planning, the manufacturing and the commissioning of a new large-scale full plant.

Steeco was focused on a new production line featuring high versatility (manufacturing of paving stones, blocks, kerbstones and other products of 500 mm height), optimum quality products in terms of height, strenght and aspect, whilst offering the highest production rates. The choice fell on a fully automatic installation type Quadra Q12 HP equipped with state-of-the art equipment. This turnkey project was driven under the leadership of Quadra for the highest satisfaction of the client. Quadra delivered a turnkey solution, including the complete design and engineering stages as well as

the entire range of equipment and machinery.

Block machine Q12 HP synonymous for high scale production and high quality product

The core component of the new production line is first and foremost the block machine. Designed for multi-products production, the Q12 HP allows high-class product manufacturing as well as high production rates. In addition to several patented systems, this machine benefits from efficient hydraulic

and vibrating equipment which enable its to achieve an outstanding throughput rate making the Q12 HP the most productive machine within the range offered by Quadra.

With this machine, Quadra provides its customers with great ease of operation whilst ensuring high safety standards as well as high profitability. Highly performing, this block machine displays a striking industrial rate (between 13 and 15 seconds for manufacturing two-layers paving stone). Its fully automatic operation allows reliable pro-



The manufacturer Steeco, based in Riyadh, regularly invests in production equipment and is now a partner of Quadra.



The block machine Q12 HP displays a striking industrial rate: between 13 and 15 seconds for manufacturing two-layers paving stone.

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duction of constant quality, with the highest height accuracy.

The block machine commissioned by Quadra is unique because of their configuration. Mounted on anti-vibration feet, the frame (large and heavy one-piece steel structure) is protected from vibrating solicitation. The lateral position of the motors allows no required civil engineering (such as a pit). No vibrations are transmitted to the ground, and the elevated and ventilated architecture of the block machine allows easy cleaning and maintenance operations.

With its unique vibration features, Quadra makes commitments regarding the quality of the manufactured products in terms of density, strength, weight and height within an optimal cycle time. These features have quickly convinced the manufacturer Steeco to moving towards this type of machine called "high performance".

The vibrating system included in this machine ensures a perfect product compaction through a filling operation during which the amplitude and the vibration settings are different between the front and the rear of the mold (patented system). This pre-vibration system with "flexible force and speed" enables a more uniformed and homogenous filling on the whole surface of the mold. This dynamic compaction optimises the density and the consistency of the manufactured products, whilst achieving a more efficient cycle time.

The retractable static bars (patented system) also strengthen the efficiency of the filling operation. Moved into low position during this operation, they result in a maximum vibrating amplitudes of the mold. In addition to shorter cycle times, the retractable static bars are not in contact with the pallet or the mold for avoiding any heavy and repeated impacts.

To finish, the Q12HP guarantees a height accuracy of less than 1 mm. The tamper head always goes down at the same position, and meets on a mechanical stop. When the tamper head reaches the mechanical stop, a final vibration is performed and allows calibration of the top references of the products. As for the bottom references, they are ensured by the static bars that go up at the fixed height. Consequently, whatever the height of the products, the tamper head always stops at the same position, thereby achieving consistent height accuracy.



This manufacturer has been displaying an exponential growth through continued expansion of its product line

Versatile, multi-product and multi-purpose production line for manufacturing an extensive range of high-class products

Steeco succeeds in gaining great market shares in modernising its offering through continuous introduction of new products. The strong expectations of this manufacturer were naturally related to the flexibility of its newly commissioned machine concerning shape, color and finition of the manufactured products.

The batching and mixing plant is equipped with a mixing color system for manufacturing colored concrete. This device allows the configuration of customized colors for paving stones and any kind of concrete products. Equipped with the face-mix device, Steeco can manufacture two-layers products with core concrete and face-mix concrete. This equipment is fully remotely operated. Its forward movement and fixing to the block machine is very quick. Its unique features enable a homogeneous repartition of the face-mix concrete on the whole surface of the product in order to produce a consistent aspect (layer) on the entire product.



The washing station allows a high-class surface treatment.

A washing station was also commissioned on the fresh product conveyor. This equipment aims at producing a high-end finishing and a great aesthetic. The production pallet, which has just come out from the block machine, undergoes a surface treatment for withdrawing the grain of the concrete aggregates. A trolley is equipped with water spray, which moves transversally. The treatment is carrying out through water projection in the length of the products, and all over the surface of the pallets carrying kerbstones, slabs or paving stones. All settings that may have an impact on the final aspect (dis-



Polystyrene inserter: streamlined configuration for simple and quick ease of operation.

tance, water pressure, speed, number of passage, inclination etc...) may be configurable. This device is also designed for consuming a minimum amount of water.

Steeco is also renowned for its insulating blocks. The polystyrene inserter is positioned on the side of the block machine and allows generous and direct access for the operator. The operator put the polystyrene on a template, and then turns on the automatic forward movement of the trolley. This device requires only one operator located in the secured area. Mounted on the side of the block machine, this operation can be put into operation within minutes.

For meeting its extensive product line, the production changeover turned out to be a key condition. It was indeed of prime importance that the mold changeover was fast and easy within a short downtime. The technology offered by Quadra is once again convincing. Performed in less than 10 minutes, this operation is entirely remotely controlled by the operator who stays in the secured area. No manual handling is required. This provides optimum clamping and makes it easy to change without any additional tools. The manufacturing receipts are recorded and all setup parameters are directly incremented for each group of products.

Finally, a station to measure the height of the products was commissioned as well. Equipped with 3 lasers, the scanner measures the front height and the rear height of the products. These information enable to identify the average height of the products, the upward or downward trend of the products height, and report any alteration by alarms. This device provides the manufacturer with an automated control that naturally involves high quality product.

The complete plant is supervised from the machinery control room located in the middle of the production line. Equipped with glazed windows, the control room is noise-insulated for offering appropriate work conditions. All drawings of the building are provided by Quadra.

This factory is controlled by high-end controlled software designed by Quadra displaying the full plant. The operator may watch easily and quickly the whole production cycle. A touch screen terminal allows adjustments and observations of all parameters throughout the production process.

Clear, intuitive and user-friendly interface allows easy modification of the block



The complete plant is supervised by only one operator located in the centralized machinery control room.

machine settings. Any interruption in production are fully described, and thanks to the program structure, automatic cycles are quickly and easily resumed. Machine settings are stored and recorded by production recipe in order to retrieve easily manufacturing parameters associated to a type of product.

This control-device is also a pertinent tool for managing the overall production since it indicates operating data in progress (time cycle, filling level, daily production, rates etc.), and other information such as production shutdowns, number of cycles for each mold. These production data are detailed, recorded, and may be then analysed by the customer in order to continuously optimise rates.

Transfer and handling system: state of the art commissioned equipment

The production pallets loaded with fresh products are carried from the block machine into the elevator by means of conveyor.

Once the elevator has reached its maximum capacity, the finger car takes over all the production pallets and moves the fresh concrete product into the curing rack. The curing area may receive 6300 pallets, and is equipped with a ventilated and humidity-controlled system that ensures consistent and uniform curing environment.



Daily management of the day		
Number of destinations of origin	Nb of created boards	Nb prod manufactured
SA RESOURCES 01 ACCOUNTS OF SALES	411	2408
B	0	0
B	0	0
B	0	0
B	0	0
Total of total		
	411	2408

Operating line management	
First plate test	00:04min
Last plate test	00:00min
Line stop operation	00:00min
Stop for operation	00:00min
Presence in aisle at block production	00:00min
Line in automatic	00:00min
Total of waiting	00:00min
Waiting for Fork	00:00min
Waiting for Fork Plate	00:00min
Waiting for Press	00:00min
Waiting for Press	00:00min
Net operating time	00:00min
Operational hours	00:00min
Prod. hours	00:00min

High-end controlled software designed by Quadra.

CONCRETE PRODUCTS & CAST STONE

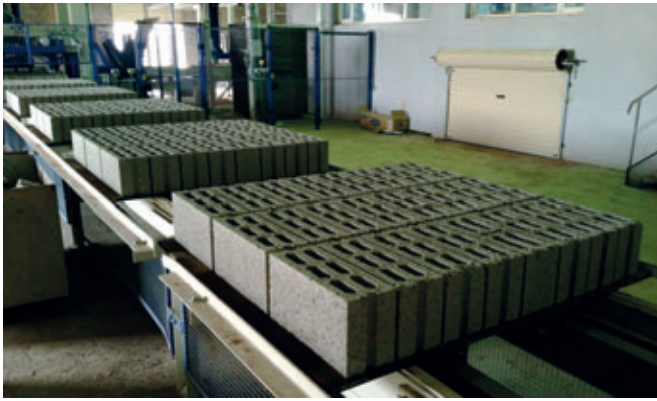
The finger car with rotating platform has the advantage of saving floor space within the building. The curing solution is indeed engineered to give the optimal utilisation of space. The position of the finger car is continuously monitored by laser probe and driven by servomotors for motorised position centering and accurate positioning of the platform in front of the rails of the curing racks, elevator and lowerator.

After a curing time of approximately one day, the finger car retrieves the production pallets with cured products and moves them back to the lowerator. The pallets loaded with products are finally transferred to the cubing station via a walking beam conveyor. This type of conveyor lifts and moves the pallets without any friction. It also means no wear, and no noise.

The cuber clamp is designed and manufactured by Quadra. The use of servomotors and continuous monitoring of the position of the



The finger car with rotating platform performs the storage operations.



The pallets loaded with products are finally transferred to the cubing station via a walking beam conveyor.

clamp allow very accurate placement of the blocks as well as very high production rates. The cuber clamp is suitable for all types of products and is designed for supporting heavy loads such as kerbstones. The use of servomotors and continuous monitoring of clamp position allow very high rates and reliable loading even at high cubing speeds

The pallets with finished products are then transferred to the strapping station, and transferred on the park via a galvanised slat conveyor. Equipped with geared motors, this type of conveyor allows blocks to be transported either with or without wood pallets. State of the art equipment, this conveyor also allows one or several vertical strapping.

Finally, in order to involve utmost flexibility of the plant as well as production optimisation, one pallet buffer storing 600 pallets was implemented between the manufacturing station and the cubing station. This storage allows maximum flexibility manufacturing by disassociating the fresh production line from the dry production line ensuring continuous running of the block machine.

Conclusion

Thanks to ongoing innovation as well as high quality equipment, the company Quadra has been recognised among the leading equipment manufacturers serving the concrete industry. High performance and high automation, simple and smart operation, long service life and user friendly maintenance are the signature features of Quadra production equipment and plant equipment systems.



Cubing station





Pallet buffer with 600 pallets stored.

The commissioning of this large-scale production line is a success, and enables Quadra to have a great reference in Saudi Arabia. The manufacturer Steeco is once again extremely satisfied with the quality of the commercial relationship and the support displayed from the beginning of the project, and is now a real partner. Both the scale of production and the high quality product perfectly met the initial commitments. This new investment enabled Steeco to raise its production capacities and strengthen its market position. This company is now well-established as one of the leading manufacturer within this industry, equipped with the most advanced production facilities in the Middle East.

Following training provided by qualified technical staff, Steeco now benefits from the customer service directly available in the Middle

East. In addition to after-sales assistance, Quadra has a stock of spare parts available in Riyadh. The hotline connection also allows access to all machine parameters in order to provide quick and effective assistance. The production line can be supervised and operated remotely from Quadra's premise which give the possibility to go on line and perform trouble shooting and preventive maintenance. ■

FURTHER INFORMATION



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