

Quadra, 74130 Contamine-sur-Arve, France

Fully automatic demoulding line commissioned in the United States: speed, versatility, and handling precision

Rochester Concrete Products is a third-generation family business, with mortarless concrete manufacturing and construction expertise dating back to 1914. Specialised in residential and commercial landscaping products (slabs, pavers, retaining walls, edgers, outdoor living kits, site furnishing, etc.), Rochester Concrete Products manufactures and distributes some of the most respected brands in the hardscapes industry, such as Interlock Concrete Products, Silver Creek Stoneworks, Rockwood Retaining Walls, Necessaries Outdoor Living Kits, Rosetta Outdoors, Keystone retaining wall systems, Techniseal, Alliance Gator, Snap Edge Paver Restraint, AWS Pedestal System, Strata Systems and Super-Stik. The reputation of this group relies on the premium quality of its products, which combine beauty, durability, efficiency and sustainability. This is of high importance for Rochester Concrete Products to continually develop new products and services that exceed the social and environmental requirements of America's landscapes.

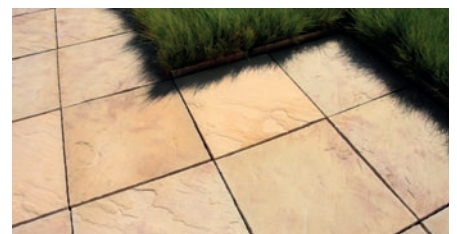
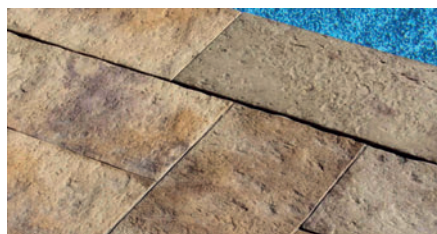
Silver Creek Stoneworks, established in 2006 and based in Rochester, Minnesota, has quickly become known for its high-

quality landscape tiles, pavers, steps, pillars and caps, renowned for their finish (handcrafted limestone aspect) and their diversity in terms of colours, shapes and dimensions. The growth of the activity prompted Silver Creek Stoneworks to invest in a fully automatic demoulding line. This previously manually performed operation was no longer effective in following the filling rates that had become increasingly large due to the growth of the activity.

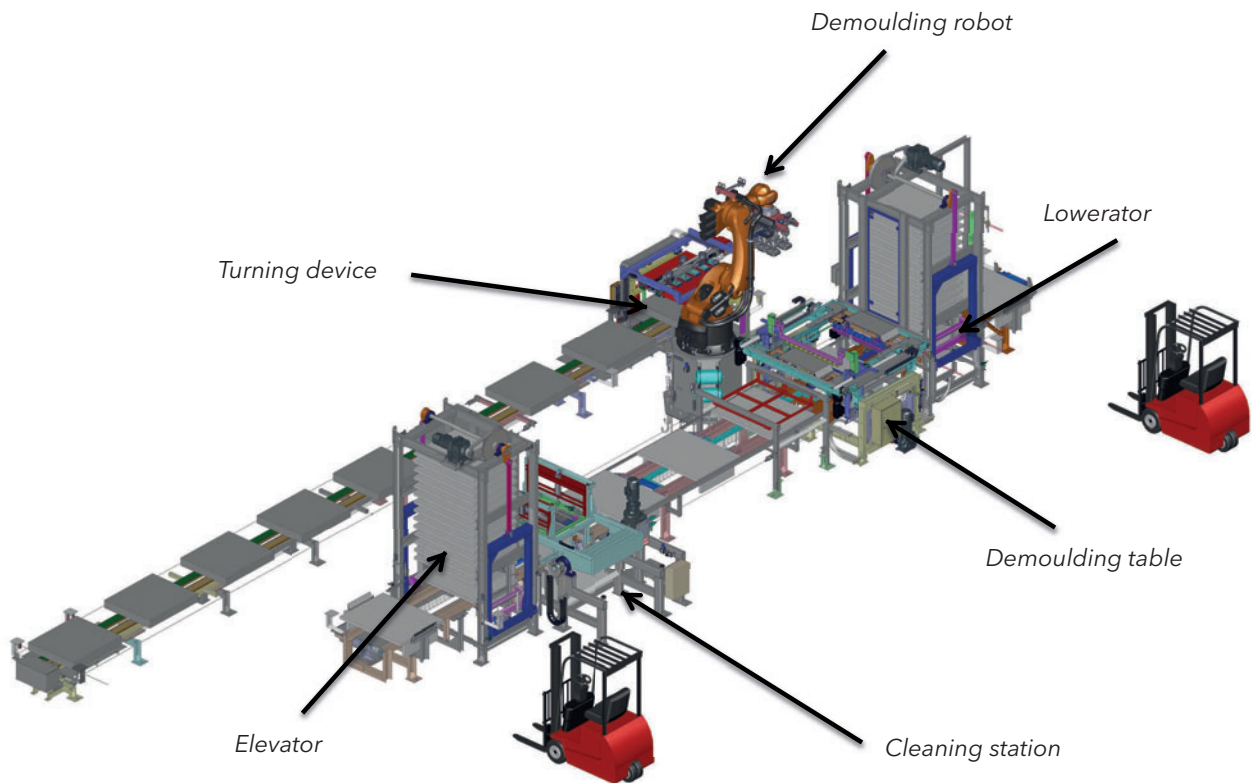
Silver Creek Stoneworks was quickly convinced by the advances features of the equipment provided by Quadra, a leading French manufacturer of equipment for the concrete industry, these being mainly the technology and the versatility of the proposed solution, as well as the valued production rates that played an active role in the decision.

Installation

Quadra has commissioned a complete demoulding line, fully automatic, equipped with one robot, one demoulding table, one cleaning station, one lowerator, one elevator and the conveying systems.



Types of product manufactured by Silver Creek Stoneworks



3D representation of the demoulding line: one elevator, one lowerator, one demoulding table, one robot, one turning device, one cleaning station and the conveying systems.

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Curing area

The moulds loaded with fresh products are stored in the curing area. Once dried, the fork-lift truck retrieves the mould stack and places it on the conveying system located in front of the lowerator. The conveying system moves the mould stack into the lowerator. With a capacity of 15 pallets (600 mm high) or 7 pallets (340 mm high), the lowerator feeds the demoulding line. The moulds are moved to the demoulding table via a conveying system.

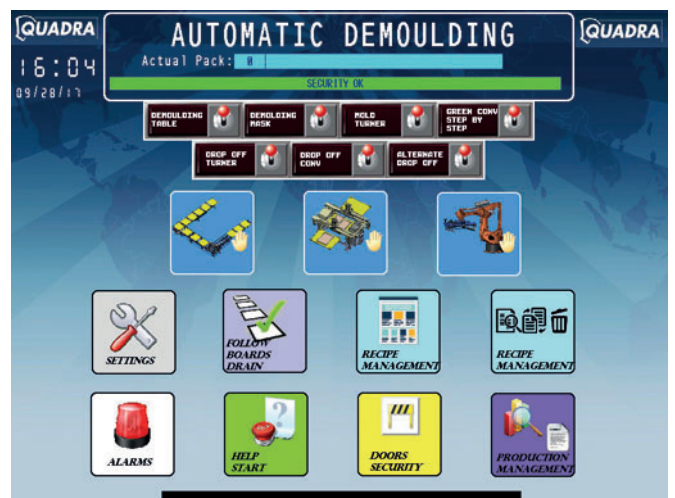
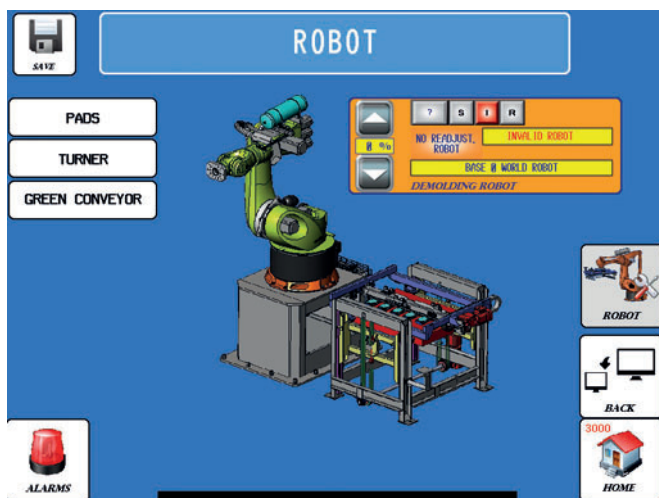
This demoulding operation is performed by a 6-axis robot type Kuka KR360. Thanks to identification by the PLC, the demoulding robot is able to remove all kinds of product with different shapes and sizes. The adjustment is fully automated and does not involve any human action from the operators. This station is equipped with an adjustable frame system that holds the mould on the pallet during the demoulding operation, with automatic movement by pneumatic cylinders to fol-



6-axis robot type Kuka KR360, driven by PLC.

low the shape of the mould. This clamping system allows the deformation of the mould, and facilitates the lifting out of the products without any damage during the demoulding.

The handling clamp of the robot is designed, developed and manufactured by Quadra and therefore fully adapted to the required handling. The clamp is equipped with six independent pads, guided by linear control. The use of servomotors



High-end control software designed and developed by Quadra.

and continuous monitoring of the position of the clamp allow very accurate demoulding as well as very high production rates.

A concrete product turning device was commissioned in order to present the textured surface of the products to the conveying system in some cases. The products are held on the turning device by the gripping device and the rotation is performed by geared motors.

No manual handling is required during the process. The robot is delivered with high-end control software. Quadra designed and integrated the automation programs within the man-machine interface. The software is adaptable and easily updated to follow the client's changes, developments and evolution. The settings and recipes are easily changed from the control desk. More than 200 recipes are stored and match 200 different product references. A touch-screen terminal allows the adjustment and preview of all demoulding parameters. The interface was designed to be clear, comprehensible and intuitive. The operator selects the number of products to be demoulded and the number of products to be placed directly in the conveying system or in the product turning device. The interface also provides pertinent production statistics such as the number of references that were demoulded, the number of pallets, the number of products per recipe, etc. All the production data are detailed and recorded and enable the manufacturer to analyse them at a later stage in order to continuously optimise rates.



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A belt conveying system moves the products that have just been demoulded from the demoulding station to the palletizing station, through an area dedicated to the quality control of the products.

The empty moulds are then cleaned by being turned over and blown off with air before being transferred to the elevator. The empty moulds are stored in the elevator and then removed on a conveying system, from which they are retrieved by the fork-lift truck and reintroduced into the production line for a new filling cycle.

Robotisation: milestone in the concrete industry

Robotisation is increasingly being used in the concrete industry and is opening up new handling areas: the automation of recurring, heavy or hazardous tasks for the operators, the reduction of maintenance and the improvement of productivity.

Silver Creek Stoneworks was convinced by the technical solution provided by Quadra, which was fully designed and developed according to its production needs: a versatile equipment that is able to adapt in real time to moulds and products of multiple formats. In fact, Quadra applied its expertise in automated processes as well as its experience in development to provide handling solutions that are fully customized to the current and future needs of its clients.

Quadra integrates robots supplied by Kuka and counts more than 200 robots operating worldwide for multiple applications.

FURTHER INFORMATION



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