

Kraft Curing Systems GmbH, 49699 Lindern, Germany

The Müller-Steinag Group increases production capacity with a new concrete curing system

■ Mark Küppers, CPI worldwide, Germany

At the Rickenbach site, the Müller-Steinag Group operates two self-sufficient concrete block lines in separate production halls. High-quality paving stones, masonry blocks, slope reinforcements, filter plates, block steps etc. are manufactured on Omag block making machines, which have already been in use for many years. The older of the two Omag block making plants was built in 1981 and has thus been in operation for a proud 40 years. Such a long period of operation is also possible because the plant has been continuously adapted through modifications and is regularly maintained by renowned machine construction companies. In the case of the younger block making machine, for example, the conversion to facing and dye metering was carried out in 2000, while in 2010 the plant was equipped with a Siemens S7 programmable logic controller, and for years Rekers packaging robots have been ensuring improved processes on the dry side. In a further step, a new concrete curing system has now been installed by Kraft Curing Systems GmbH at the Rickenbach plant to counteract storage capacity bottlenecks in the curing chamber.

The Müller-Steinag Group is an owner-managed, independent and autonomous company in the fields of concrete products, natural building materials, prefabrication, recycling, waste disposal and water technology. The four sales companies Creabeton Baustoff AG, Creabeton Matériaux AG, Müller-Steinag Baustoff AG and Müller-Steinag Element AG support the Group's credo "networked, competent" for the Swiss construction industry. With more than 1,150 employees, the Müller-Steinag Group is a reliable social partner for the communities in which it operates in Switzerland's Central and Pre-Alpine regions, in Western Switzerland and in the cantons of Graubünden and Ticino.

Creabeton Baustoff AG

Creabeton Baustoff AG offers complete solutions and high-quality Swiss products for building construction, underground construction and road construction, as well as for garden and landscape construction. The company's own fleet of vehicles and the various regional locations guarantee an excellent delivery service.



Surrounded by picturesque scenery, the headquarters of the Müller Steinag Group in Rickenbach in the canton of Lucerne.



On-time delivery is guaranteed thanks to the modern transport fleet.



The impressive concrete products for garden and landscape construction also meet very high requirements.

Creabeton Matériaux AG

Creabeton Matériaux AG was integrated into the Müller Steinag Group only this summer. The approximately 380 employees of Creabeton Matériaux AG at four locations were all taken over when the company changed hands. Creabeton

Matériaux AG also offers total solutions and high-quality Swiss products for building construction, underground construction and road construction, as well as for garden and landscape construction. The four regionally anchored locations guarantee delivery reliability, consulting competence and customer proximity.

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Müller-Steinag Baustoff AG

Natural building materials from the plants in Rickenbach LU and Stansstad NW: aggregate, gravel, grit, sand, crushed stone, concrete, ready-mixed concrete, recycled concrete, excavated material and inert material landfill.

Müller-Steinag Element AG

Prefabricated concrete elements for buildings and underground construction: prestressed and noise protection elements, multi-storey car parks, columns, stairs, prefabricated garages, underground car park systems. Full service from concept to installation.

Rising sales can also create problems

The Müller-Steinag Group uses only high-quality raw materials for the manufacture of its concrete products. The manufacturing plants make use of a comprehensive ISO quality system as a management tool and as a basis for the continuous further development and optimisation of production processes and products. The entire product range meets the requirements of SwissBeton, the Professional Association for Swiss Concrete Products, and European standards. The timely dispatch of all concrete products to building sites throughout Switzerland is guaranteed thanks to the modern transport fleet.

In Rickenbach, concrete products with block heights of 6 to 30 cm and various surface dimensions have been produced with extended working hours up to now, with an annual production output of approx. 43,000 t. Due to constantly increasing sales, however, additional shifts have had to be worked in the recent past, often on Saturdays as well. Frequently, the plant could no longer produce because the capacity of the curing chamber was exhausted.

"The production management was studying a chamber extension, but this would have had several negative effects, such as the loss of storage space outside, the risk of thermal bridging (new building to old building), the finger car including the control system would have had to be extended and additional production boards would have had to be purchased," says the Head of Research and Development/Projects at the Müller-Steinag Group, Roland Erni. "So I looked for another solution and found it with Kraft. After a short evaluation phase with the first discussions in November 2020, the management decided in favour of the conversion starting in February 2021", continues Roland Erni.

"The target was clear: the old chamber heater was to be removed and replaced by a Quadrix system from Kraft. The entire chamber was also to be re-insulated in all necessary places. A new extension to the chamber was planned as a plant room in which all technical plant components were to be housed." Roland Erni describes the expected direct influence on the products as follows: "It also had to be possible to palletise the products after about 8 hours, and in some cases also to feed them the next day for further processing to KBH's finishing lines or to the ageing drum with the new Penta sorting and packaging system - and of course we expected an improvement in the already very high product quality through controlled heat development."

The planning and purchase of the new plant was completed within one month in December 2020. The entire Covid 19 measures with their corresponding consents did not make the task any easier. On February 1, 2021, Kraft began construction according to the specifications. Due to the local conditions, the ceiling was insulated under difficult conditions,



Filter plates and embankment stones made by Müller Steinag

and pipes and ducts for the supply and return were installed. Motors and blowers were put into place until the 5 truck-loads of installation parts had all been installed, and the chamber was finished after one month.

"During the chamber rebuild, the regular annual overhauls were performed on the block making machine, dry side, robot, etc. All the works were completed in coordination with one another and so we were able to store the first products in the new chamber on 3 March 21," says Roland Erni, expressing his satisfaction with the work.

"At a temperature of 33 °C and up to 85 % humidity we now produce our products and can pack the cured products after about 8 hours on the packaging line even at the low outside temperatures in spring. The products have a very good visual appearance. Blocks in the lower area of the curing chamber and blocks in the upper area no longer show any colour differences. In addition, our goals such as meeting deadlines for reconstruction, increased efficiency and quality, faster finishing of products and less Saturday work were met."



Modern heating technology for a better environment

The central heating system, which is fired with wood chips, supplies almost the entire production facility, adjacent residential buildings and the entire office buildings with heat. For the 2018/19 heating season, for example, energy production was calculated to be almost 4,000 MWh, resulting in a calculated fuel oil saving of almost 400,000 litres, or just under 13 full tanker trucks.

The calculated saving of CO₂ was an impressive 1,128 t. The energy produced by the wood chip heating system in the 2018/19 season could have provided heating to well over 1,000 homes.

The system burns wood chips from trees from domestic forests that cannot be used meaningfully by the timber industry due, for example, to bark beetle infestation.



Quadrix plant room with all technical plant components



Quadrix

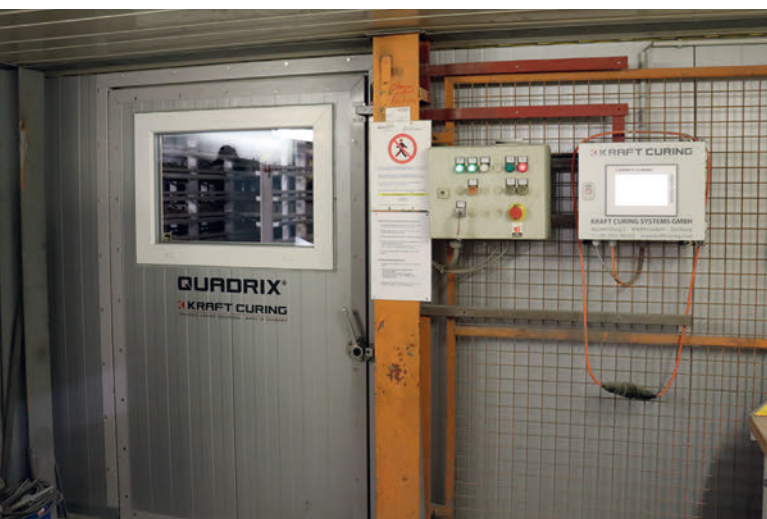
Kraft Curing's Quadrix concrete curing system accelerates the curing process through the controlled addition of heat and moisture. This ensures a constant curing climate at all times. The system allows high air volumes at low flow rates.

The curing chamber is clad with insulated sandwich panels. Energy losses are thus considerably reduced.

Thanks to Kraft's technology, fog and condensation can be prevented in the climate chamber even at 40 °C and 90 % RH. This ensures trouble-free operation of the sensors (light or laser sensors). The steel structure also remains protected from corrosion under these conditions.

The Quadrix heat and circulation system is made of high quality materials such as stainless steel and aluminium. High-performance radial fans are located in the fan unit. The hot air generator, which is equipped with a stainless steel heat exchanger, achieves an efficiency of 94 %.

The AutoFog humidification system adds atomised water when humidity is too low. The water is filtered, decalcified and submitted to antibacterial treatment beforehand. The tailor-made air ducts ensure an even distribution of heat and humidity. Hundreds of ventilation flaps ensure a constant low air flow - distributed over the entire curing chamber.



Access to the curing chamber



The processes in the camera-monitored curing chamber can be followed on a 55" screen.



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View inside the curing chamber with the Quadrix pipe systems on the ceiling and floor.



In the background you can see the insulated service door

With Kraft's AutoCure control system, the temperature and humidity in the chamber can be regulated - separately. The control system allows the monitoring of all parameters by means of a TFT colour screen and, if required, also the recording. The temperature and humidity are measured by sen-

sors distributed in the chamber. Kraft's custom air curtain - on both the wet and dry sides - prevents warm and moist air from escaping the chamber. The unit is heated to prevent condensation.



Blocks in the lower part of the rack and blocks in the upper part no longer show any differences in colour.



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FURTHER INFORMATION



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