

Kniele GmbH, 88422 Bad Buchau, Germany

# Extensive modernisation of the concrete mixing plant pays off for Studer AG

■ Mark Küppers, CPi worldwide, Germany

K. Studer AG is an extremely renowned manufacturer of building elements made of ashlar, natural stone and concrete. Production takes place in a modern and spaciouly designed plant in Frick (Aargau/Switzerland). The product range extends from standard products to custom-made products and thus meets practically all customer requirements. The concrete is produced in a mixing plant that is probably not found anywhere else in Switzerland. The plant consists of 64 silos, equipped with a wide range of facing materials in a wide variety of colours and grain sizes. The mixing plant is the heart of the entire production. It is computer-controlled and mixes the desired type and quantity at the push of a button. Thanks to this plant, almost every colour and grain size requirement of the customers can be fulfilled individually. The mixing plant was recently completely overhauled in order to meet the increasing requirements even better. Whereas three countercurrent mixers were previously in daily use, this task is now performed by two Kniele conical mixers, which produce up to 60 different recipes every day. One of the special challenges in this project was the requirement that colour changes must always be possible - without significant interruptions in concrete production. The adjustment of the plant and the running-in of the recipes for the demanding concretes were carried out by CME, the official representative of Kniele in Switzerland.

## More than a family business

In 1923, Konstantin Studer signed the first building contract and founded his own company. The company successfully produced cast stone for door and window frames, external stairs, well and flower troughs. K. Studer AG constantly adapted to changing market requirements and continuously expanded its business areas. Thanks to its ultra-modern production facilities and a motivated team of qualified employees, K. Studer AG in Frick is now one of the leading companies in the industry in Switzerland and the surrounding countries.

The standards are high, because Studer wants to offer its customers comprehensive and personal advice and services from one source. This is why Studer also employs its own qualified team of assembly, laying and service staff to professionally lay and install the high-quality products. At Studer, customer satisfaction is not just an empty phrase.

Studer produces around 40,000 stair steps and over 40,000 m<sup>2</sup> of floor covering annually. The company transports 4,000 tonnes of cast stones and concrete elements. Studer plans, advises, produces and renovates.



Studer decided on the two conical mixers KKM 375/550 and KKM 750/1125, each with reinforced drives.



The mixing principle of the Kniele cone mixer is based on a conical mixing trough.



The mixing plant is computer-controlled and mixes the desired recipe at the push of a button.

## Well prepared for special requests

Architects, building owners and companies benefit from the many years of experience and the high quality standards of K. Studer AG. This is how very special solutions are created together. For special requests regarding the mould, the company has its own custom carpentry workshop. It conceives, designs and produces models. Hence, almost no restrictions are placed on the creativity of the planners and architects. This is how even the boldest ideas take shape at Studer.

## Investment in people and technology

Such diverse production means ongoing investment in know-how, training, machinery and equipment. Internal processes are constantly being optimised and made even more rational and efficient. Major investments are also being made in the occupational health and safety of employees and in the infrastructure. The latest investment in technology was the extensive modernisation of the concrete mixing plant, with the 2 Kniele conical mixers as core components.

## Two concrete mixers as central elements

### Conical mixers with reinforced drives

Studer decided on the two conical mixers KKM 375/550 and KKM 750/1125, each with reinforced drives. The mixing principle of the Kniele cone mixer is based on a conical mixing trough. Due to the two counter-rotating agitators, a homogeneous concrete mix is produced in a short time.

Two agitators are mounted coaxially in the central axis of the conical mixers. The central helical agitator drives the mix upwards in a vertical direction, imparting a rotational movement to the mixture transported by the screw. The outer mixer arm agitator counteracts this rotational movement. These opposing and crosswise mix flows result in strong swirling of the entire mixture and thus fast and intensive mixing.

The two mixers are equipped with a water dosage system with an accuracy of 200 ml, which is suitable for both coarse and fine dosing. The high accuracy was particularly important to Studer in order to be able to produce rammed concrete and SCC of very high quality.

### Forced mixer dedusting

The mixers were each equipped with a forced mixer dedusting system. Cement scales take care of the dosing of the white and grey cement.

The existing special fibre dosing system for very small quantities including positive scale from Incite was modernised by Kniele.

The mixing plant controller is from Bikotronic, complete with water batching computer and sand moisture measurement.

Also requested and implemented was a special colour dosage system even for very small concrete batches. This required a very high accuracy of the dosage.

### Mobile precision scale for colour granules

The Würschum company from Ostfildern manufactured a special construction that takes into account the local conditions. The 10 basic colours are dosed from pre-silos, whereby these pre-silos are located on the floor above the plant due to the ceiling height. The pre-silos stand on the ground and 10 holes were drilled through the concrete ceiling. The small intermediate containers were screwed to the ceiling

### Kniele mixers and plants

Mixing plants made to your requirements:

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### Kniele GmbH

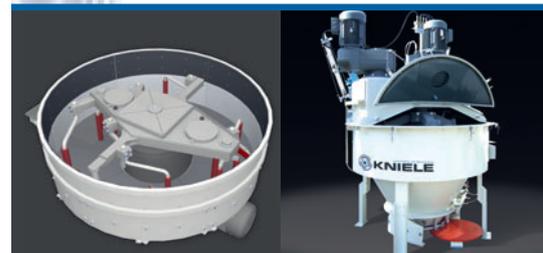
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The Würschum company from Ostfildern manufactured a special construction which takes into account the local conditions.

from below. The 10 colour positions are moved by a mobile scale for the precise dosing of granulates. The system achieves an accuracy of +/- 5 g. The scale can thus display additive dosages from 100 g to 15 kg. The scale then

moves over the pressure pod and empties the colour batch. The COM type pressure pod is then conveyed pneumatically via a diverter valve into two mixers. The pressure pod is placed on weighing cells, so that an optimised conveying cycle and empty signal are ensured.

Würschum also supplied the admixture batcher with 4 chambers for 8 admixtures with coarse and fine dosing.

**State-of-the-art cement silos**

As part of the modernisation of the concrete mixing plant, the 5 cement silos were brought up to the latest state of the art. These included new filter technology and overflow protection.

**Automatic cleaning with double unit**

Studer had demanded very fast cleaning of the mixing plant for the frequent colour changes. For this purpose, Kniele has installed a high-pressure mixer cleaning system with double unit (2 x 14 kW, 2 x 42 litres/min and 160 bar cleaning pressure) for the two mixers. This cleaning system enables Studer today to change from red concrete to white concrete within 5 to 6 minutes, for example.

**Washing plant for sand and gravel**

Ecofrog supplied the washing plant for sand and gravel, including the direct discharge from the mixer on the higher level into the bucket wheel (filter press and settling tank were provided by the customer). Based on the principle of flotation, the wash-out machine separates residual concrete into the components mixed gravel and residual water (cement and fines suspended in water). The residual water runs in free overflow into an agitator tank and can be pumped from there back into the mixing plant. The separated mixed gravel is conveyed out of the machine via a rising vibrating chute with simultaneous drainage.



High pressure mixer cleaning with double unit (2 x 14 kW, 2 x 42 litres/min and 160 bar cleaning pressure)



*Ecofrog supplied the washing plant for sand and gravel*

### Special concrete bucket for SCC including helical agitator

Studer uses a concrete bucket with agitator from WMW to transport self-compacting concrete to the work tables. The concrete discharge of the crane bucket takes place via a slide gate. The slide gate is operated by hydraulic cylinders. An open screw conveyor is located directly above the gate. This

serves to move the concrete and thus extends the processing time. This special bucket has a second mover, a shaft with several paddles that are swivelled back and forth by hydraulic cylinders. This prevents the solids from settling quickly. The SCC crane bucket is operated via the pendant crane control of the on-site overhead crane which contains the functions of the distributor.



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Studer uses a concrete bucket with agitator from WMW to transport self-compacting concrete to the work tables.

**KKM 30 laboratory mixer for the development of recipes and small-scale productions**

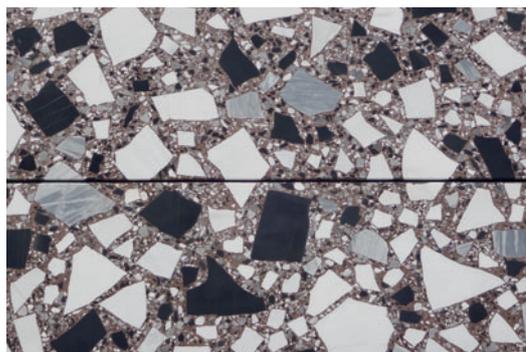
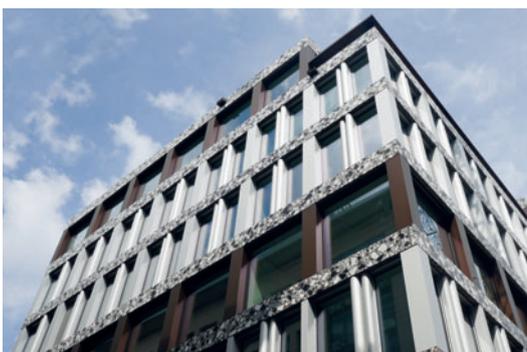
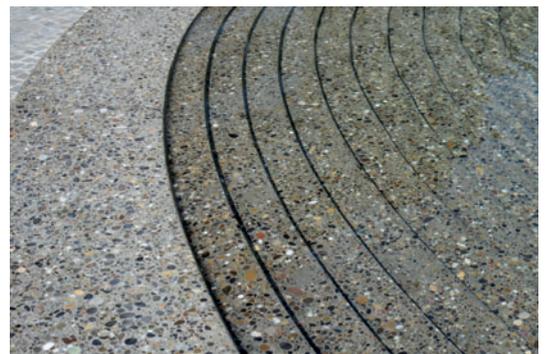
Studer also invested in a Kniele laboratory compulsory mixer. This convinced the company with a very precise and homo-

geneous mixing result. Due to the conical shape, even very small quantities can be mixed in high quality. Filling, emptying and cleaning are quick and easy. With this conical mixer, not only quality concretes of all kinds, such as self-compacting concretes or lightweight concretes, can be produced. ■



Studer produces about 40,000 stair steps annually

Elaborately produced fountain, Münsterhof in Zurich



This building in Zurich was given a special façade

FURTHER INFORMATION

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