

Kniele GmbH, 88422 Bad Buchau, Germany

New mixing plant for even better architectural precast concrete elements

■ Mark Küppers, CPI worldwide, Germany

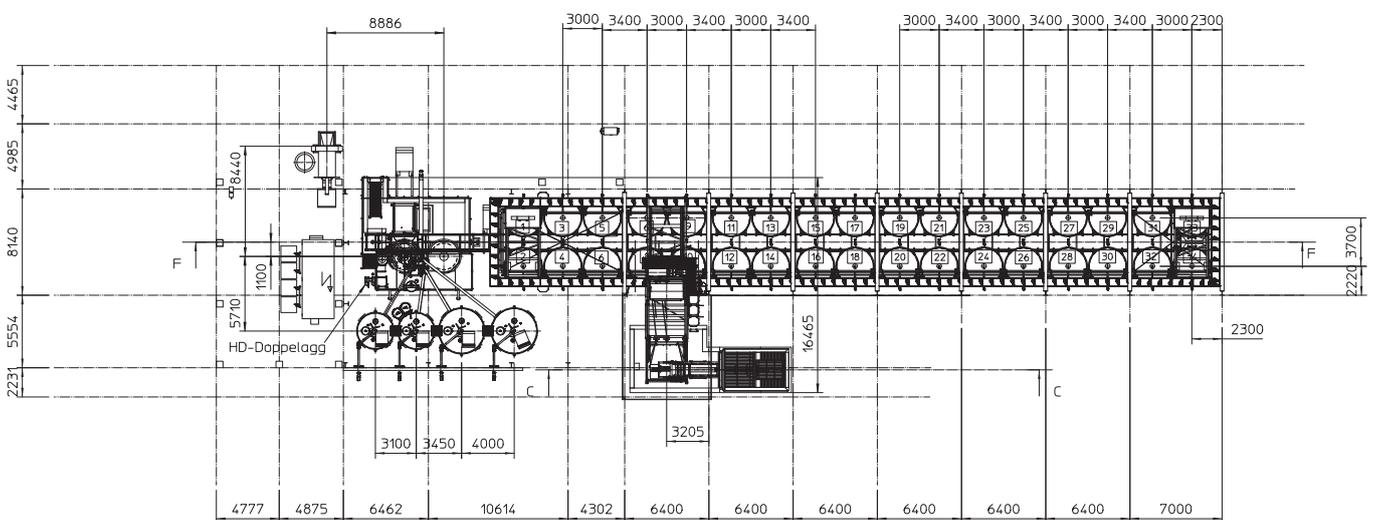
The Decomo SA company, located in Mouscron near the French border in southern Belgium, produces precast elements in architectural concrete. People are and will be the decisive factor in the design and manufacture of architectural concrete. At Decomo they are supported by an efficient production apparatus that is constantly optimised through new investments. After most recently integrating new Construx tilting tables into the production, modernisation of the complete concrete production now stood on the agenda. The result is a new mixing plant with 34 silos for an extensive selection of aggregates and a cone mixer as the centrepiece of the new concrete production. The complete dosing and mixing technology was supplied by Kniele GmbH in Germany. Decomo was once again able to increase the concrete quality with this investment, thereby meeting its own very high standards. And the high number of aggregate silos in itself suggests the very high company standards that must be fulfilled here. The Bikotronic firm from Germany was responsible for the complete plant control system.

The respective engineer in Decomo's in-house design department guides every project from planning to execution. And that's in six EU countries and Russia, all of which have an indi-

vidual building culture. Decomo pursues a customer oriented company policy and always keeps an eye on the environment and surroundings in the process.

Decomo operates according to an exceptional quality philosophy and can show numerous national and international certifications. All elements are manufactured, processed and inspected under excellent fabrication conditions before just-in-time delivery to the building site. High quality precast elements can be manufactured in architectural concrete within relatively short delivery times. With a total of approximately 50 tables, the high production capacity enables Decomo to optimally fulfil quantity and delivery date requirements. Decomo also offers a complete surface treatment programme.

Decomo was taken over by Lieven Tsjoen four years ago and he immediately invested in the company to increase the concrete quality even further. Today, 180 employees, including many from France, work for Decomo and the order situation is very good. With a share of approx. 40 %, the United Kingdom continues to be Decomo's most important market. The other customers are primarily in Belgium, France and the Netherlands.



Layout drawing of the new mixing plant at Decomo with the 34 silos for aggregates



Each of the 40 m³ plastic silos contains different sands and fine flints in numerous different colours.

While production conditions are improved continuously through investments, Lieven Tsjoen sees problems in the changing labour market. The company relies on long-term employment relationships with its employees from Belgium and France, thus keeping know-how in the company. But new, qualified employees for production are only found with difficulty, which is, however, not only a problem in Belgium.

But Decomo always looks ahead. The goal is to further increase output, but, naturally, not at any price. "Don't just make concrete, use your brain", says Lieven Tsjoen with regard to the hard-to-predict market development that is too fast, and not only for his own taste.

In addition to modernisation, the company is also making great efforts to increase workplace safety and environmental protection through appropriate filter, cleaning and wastewater treatment technology. Furthermore, rainwater is collected in a large tank and then used in production.

Modern plant technology for very high standards of concrete quality

Together with Decomo, the Kniele firm developed and implemented a plant concept that was precisely attuned to requirements at Decomo. For precast architectural concrete elements like those manufactured by this company in southern Belgium, the requirements for aggregates and their purity are very high.

Absolute purity of aggregates (fine flints) as a basis for success

The charging of 34 aggregates silos is initially carried out from the exterior using a truck charging hopper that transfers the raw materials to a 3.0 m³ hoist. Transfer to a mobile bucket that can travel in 2 directions takes place upon arrival at the upper level. The solution with the movable bucket ensures that no material is lost or even



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KNIELE GmbH
Mixing · Dosing · Conveying

Gemeindebeunden 6 · D-88422 Bad Buchau
Tel: +49(0)7582-93030 · Fax: +49(0)7582-930330
info@kniele.de · www.kniele.de



Charging of the aggregate silos is initially carried out from the exterior using a truck charging hopper.



Aggregate transfer to a mobile bucket that can travel in 2 directions takes place upon arrival at the upper level.

falls into other boxes, which would be the equivalent of a worst-case scenario for Decomo. This could not be assured by charging with conveyors.

After every charge, the entire charging hopper is completely cleaned to prevent any clinging aggregate getting into another box later.

The 34 aggregate silos are set up in two rows that are easy to clean and empty. Each of the 40 m³ plastic silos contains different sands and fine flints in numerous different colours. There is also an option for delivery of additional special charges (fine flints).

Complete enclosure for protection from weather influences

Like the four cement silos, all 34 silos are in the enclosed hall. So, from the outside the Decomo plant does not look like a classic concrete plant, where the cement silos reach into the sky. Decomo reduces weather influences such as cold in winter and heat in summer through complete enclosure of aggregate and cement silos. Furthermore, the aggregates are protected from irrigation or contamination by the environment.



The 34 aggregate silos are set up in two rows.



Precise dosing of aggregates in the mobile scale is carried out with vibrating chutes and shut off dampers.



View of the mixer platform with the Kniele KKM 1250/1875 cone mixer

Mobile aggregate scale

Precise dosing of aggregates in the mobile scale is carried out with vibrating chutes and shut off dampers. The mobile scale with bucket attachment travels below the silos and stops under the silo with the desired aggregates. The aggregates are then transported directly to the mixer and the scale is emptied into it. The complete dosing process is fully automatic. The scale is also cleaned with every change of concrete recipe.

KKM 1250/1875 cone mixer

The mixer at Decomo stands at ground level so the mobile scale can charge it directly. This dispensed with a hoist that would in turn represent a further contamination risk and cause an additional cleaning expense.

Decomo decided on a Kniele KKM 1250/1875 cone mixer with space for a second mixer already planned and taken into account on site. It could be retrofitted at any time without great expense.

The second mixer was primarily intended for production of white concrete, because Decomo did not wish to lose a lot of time with the necessary thorough cleaning. As a rule, up to 40 different mixes are run daily, from completely white to completely black.

After the first weeks of operation, Decomo found that a colour change in the Kniele cone mixer is unproblematic and is carried out very quickly. A second mixer is therefore not needed for the time being.

The Kniele cone mixer was also the decisive reason for Kniele receiving the order for the entire plant. Lieven Tsjoen was and is impressed by the cone mixer and really wanted to integrate it into the production.

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The aggregates are transported directly to the mixer and the mobile scale is emptied into it.



The mixer empties directly into a concrete bucket that is delivered empty to the concrete mixer by means of a scissor lift mounted on a mobile trolley.

Kniele cone mixer – successfully in operation since 2000

The mixing principle of the Kniele conical mixer is based on a conical mixer trough. A homogenous mass is created in a short time due to the two counter-rotating agitators.

Two coaxial agitators are installed on the central axis of the Kniele cone mixer. One agitator consists of a cylindrical or conical screw or helical blades while the second agitator has mixing arms with mixing paddles that scrape the mixer container surface in contact with the mix.

The central helical agitator drives the mix upwards in a vertical direction, imparting a rotational movement to the mixture forwarded by the screw. The outer mixer arm agitator counteracts this rotational movement. A powerful whirling and a fast, thorough mixing of the entire mixer contents are achieved due to these opposing, transverse mix flows.

With its cone mixer, Kniele's promises include streak-free blending of colours and no loss of quality when mixing minimum quantities. The cone mixer can be completely emptied a short time and the funnel-shaped construction is very space-saving.

The cone mixer has very diverse applications. Due to independent control of the speeds of both agitators – especially the inner agitator – both liquid and earth-moist concrete can be produced with the cone mixer. Furthermore, according to the manufacturer, this mixer type is also especially suitable for special concretes, such as UHPC und SCC, fibre-reinforced concretes, lightweight concretes, heavy concretes, etc. The infinitely variable control enables precise adjustment to the specific mixture and significantly reduces the mixing time of these special concretes thanks to this optimisation.

The mixer empties directly into a concrete bucket that is delivered empty to the concrete mixer by means of a scissor lift mounted on a mobile trolley and returned full to the pickup point for the forklift. The forklift then brings the concrete to the various installation locations in the production hall.

Addition of admixtures and dyes

Admixture dosing is carried out with the four-chamber admixture weigher from Würschum.



View into the mixer immediately after cleaning



Everything at a glance thanks to controls by Bikotronic



View inside the production hall with the new Construx tilting tables



Decomo SA producers precast elements in architectural concrete



The precast elements receive their special finish.



Decomo can refer to numerous reference projects.

a) Little Manhattan in Amsterdam, The Netherlands



b.) Tivoli in Munich, Germany



c.) Crèche Hectolitre in Brussels, Belgium

However, colour dosing is carried out manually, because the extremely large variety of colours (up to 20 shades) that must be dosed in gram quantities makes automatic dosing difficult.

Bucket cleaning and recycling system

Naturally, the empty concrete buckets must also be cleaned immediately to prevent residue ruining a differently coloured concrete mixture. Washing water and concrete residues are immediately processed by the ecofrog recycling system. The automatic bucket cleaning facility was built by Decomo.

Successful project and two satisfied partners

Decomo was completely satisfied with the process of installation and commissioning of the new dosing and mixing plant. In particular, Lieven Tsjoen highlights the excellent service from Kniele. The appropriate support was available at all times.



See a video about the new dosing and mixing plant at Decomo. Simply scan the QR code with a smart phone and start the video.

FURTHER INFORMATION



DECOMO SA
Boulevard Industriel, 96, 7700 Mouscron, Belgium
T +32 56 850711, F +32 56 344891
info@decomo.be, www.decomo.be



Kniele GmbH
Gemeindebeunden 6, 88422 Bad Buchau, Germany
T +49 7582 9303 11, F +49 7582 9303 30
info@kniele.de, www.kniele.de

Kniele representative for Benelux and Switzerland:



LPI-Benelux, Postbus 62, 1633ZH Avenhorn, Netherlands
T +31 610 619190
info@lpi-benelux.com, www.lpi-benelux.com



Bikotronic Industrie Elektronik GmbH
Im Hohen Acker 7, 67146 Deidesheim, Germany
T +49 6326 96530, F +49 6326 965350
info@bikotronic.de, www.bikotronic.de



Construx b.v.b.a.
Hazebeekstraat 11, 8531 Hulste, Belgium
T +32 89 328855, F +32 89 328866
info@construx.be, www.construx.be



ecofrog GmbH
Heinkelstr. 13-15, 68804 Altlußheim, Germany
T +49 6205 204820, F +49 6205 2048220
info@ecofrog.eu, www.ecofrog.eu



Würschum GmbH
Hedelfinger Straße 33, 73760 Ostfildern, Germany
T +49 711 448130, F +49 711 4481340
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