Kaspar Röckelein KG, 96179 Rattelsdorf, Germany

Röckelein focuses firmly on growth – their recent floor element manufacturing system is followed by a brand-new concrete block production line

The Röckelein family business has been competing successfully on the market for 70 years, developing and producing high-quality construction materials from concrete. Röckelein manufactures its products at four locations: Wachenroth (head office), Rattelsdorf and Altendorf in the greater Bamberg area (Bavaria) plus Osterfeld (Saxony-Anhalt), Germany. In 2012, an entire new floor element production facility was erected. Röckelein has been able to streamline its work processes for this product area and has succeeded in making them much more efficient since moving its floor element production from its site at Wachenroth to its Rattelsdorf location about 45 km away. The site at Rattelsdorf possesses a gravel pit from which all aggregates for their own production lines can be extracted. The aggregate silo is filled directly from the gravel production facility using crusher and sorting systems. A full report on this appeared in CPI 4/2013. The site is very well suited for this type of production since a concrete block making facility with high output needs large quantities of raw materials. Röckelein showed foresight in 2012 by constructing not just a hall with sufficient space for the new floor element production line. In fact, it built a two-bay hall, whose second bay has now been commissioned for the new concrete block production line. Röckelein awarded the contract to Masa, a company from Andernach, Germany, for planning and erecting this new, fully-automated and energy-efficient concrete block making system. As regards the mixing technology, Röckelein has once again put its faith in Liebherr as with the floor elements; KBH installed a finishing line for curling and ageing; Rotho supplied their entire programme for the new concrete block line.

Mark Küppers, CPI worldwide, Germany

Röckelein erected the above-mentioned two-bay hall measuring 7,200 m² overall for creating a state-of-the-art production facility for manufacturing various concrete products at its Rattelsdorf site. Floor elements have already been manufactured there since 2012 on an Ebawe pallet circulation system with extensive automation technology. Cutting-edge machines, made by Progress, a sister company of Ebawe, for processing and positioning reinforcement are essential components of this circulation system.

Röckelein gears up for energy-efficient concrete block making

Röckelein finds Masa second to none as an absolutely reliable business partner. It is not without good reason that this family-owned company has purchased four Masa concrete block making machines in the last ten years. Röckelein and Masa worked hand in hand during the development and planning stage for the new block making system so that their combined experience of the last ten years could be invested into the project. A primary focus was placed on energy efficiency with the new system. Energy measurements were carried out at a preliminary stage, whose results are reflected in the project planning. At times, no energy from the mains is needed, for example, in the packaging process with the Masa Cuboter thanks to the energy exchange between the drive functions.

Liebherr mixing tower

In 2012, Liebherr erected an impressive Betomat IV-685 mixing tower, which stands immediately adjacent to the new hall, for provisioning the system with high-class concrete. This mixing tower was enlarged in the course of this expansion work and now also supplies the new block production line with concrete.

For producing the floor elements, Liebherr installed an RIM 2.25 ring-pan mixer (nominal content 2.25 m³) with a mechanical whirler arm and two discharge points in the tower. Aggregates from their own gravel production facility are transported up to a height of about 40 m by an inclined conveyor belt and deposited into one of the ten silo chambers using a rotating distributor.

The mixing tower was fitted out with two more Liebherr ring-pan mixers for the new concrete block production line. A RIM 1.5-D (nominal content 1.5 m³) with a mechanically driven double whirler produces core concrete fed onto a conveyor belt for the

The Röckelein site in Rattelsdorf with the twin bay production hall built in 2012 from a bird's-eye perspective

View of the floor element manufacturing line commissioned in 2012

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Masa GmbH
Masa-Str. 2
56626 Andernach
Germany
Phone +49 2632 9292 0
Service Hotline +49 2632 9292 88

Masa GmbH
Werk Porta Westfalica
Osterkamp 2
32457 Porta Westfalica
Germany
Phone +49 5731 680 0

Masa Concrete Plants India Pvt. Ltd.
#5B, KIADB, Bommasandra Ind. Area
Attibele, Bangalore 560 099
India
Phone +91 80 2628 3888
Mail info@masa-india.com

info@masa-group.com
service@masa-group.com
www.masa-group.com

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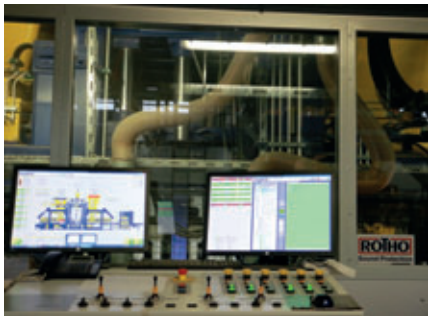
The Liebherr mixing tower supplies both the floor element and new concrete block production lines with concrete

The Liebherr RIH 0.5 Mixer in operation producing facing concrete which is discharged onto a conveyor belt

The Masa XL 9.1 concrete block making machine



The control station is installed next to the concrete block making machine, which is visible through a large window pane

Noise protection enclosure with gallery

concrete blocks. The third mixer, an RIH 0.5 (nominal content 0.5 m³), with a hydraulic whirler produces facing concrete that is also fed onto a conveyor belt. All three ring-pan mixers feature a pre-silo and separate cement and water weighing systems to achieve the greatest flexibility possible. Röckelein has integrated a Scholz dosing system with liquid colours in the mixing tower for colouring the concrete.

Cutting-edge technology and the well-proven Litronic MPS III mixing system control unit from Liebherr ensure the smooth-running production of high-quality concrete. The entire plant was clad with metal-cased insulating elements and equipped with a heating system from Sauter for assuring uninterrupted operations even at low temperatures. This Betomat IV-685 mixing tower additionally possesses an exhaust air filter system and residual concrete recycling plant.

Access and convenient material in-feed from above

As with all ring-pan mixers from Liebherr, the trough opens upwards with generous space permitting unrestricted access to the mixing tools and ease of material in-feed. This construction design also facilitates its rapid, uncomplicated cleaning. Its good-sized cover without any superstructure above the mixer makes it possible to open the mixer between 30 and 60 per cent depending on application. This assures ease of access from above and thus makes for simple maintenance.

Masa Hydrautainer and Powertainer

View inside the Masa Hydrautainer

The Masa XL 9.1 concrete block making machine in operation

Fresh products can pass through a spraying system on the wet side for optionally applying a surface coating

Material movement in the ring channel

All Liebherr ring-pan mixers are equipped with the ring trough system. This ring channel's special shape guarantees that all materials being mixed are compulsorily brought to the mixing paddles or tools and are entirely homogenised within a short period of time. The material cannot avoid the tools; it is compelled into the ring channel.

Fully automated Masa XL 9.1 concrete block making machine

Röckelein's criteria and expectations concerning its new, modern manufacturing system were clearly defined. The new machine should be capable of manufacturing top-class, quality products with a significant improvement in the block's surface. Further major priorities were multi-coloured visible surfaces for concrete paving blocks and for thin concrete slabs. Röckelein decided on the Masa XL 9.1 concrete block making machine with a noise-protection enclosure from Rotho.

The XL version with its sophisticated, cutting-edge technology is the top model among the concrete block making machines from Masa. Decades of experience and continuous advances in development have been invested in the technology of this model range. Masa sets great store by defining and implementing new requirements in collaboration with its customers and in line with the market. The XL version, for example, translates into great height accuracy with all types of concrete blocks, into short cycle times, and very high daily production output but with excellent product quality. The standard scope of delivery includes, amongst other things, continuous silo filling level monitoring by means of load cells in the core and facing concrete silos plus oil temperature control with oil heating and air oil cooling units.

Amplitude controlled vibration

The vibration is amplitude controlled. The individual adjustments possible enable blocks with a dense surface to be manufactured. This type of dense surface is the prerequisite for any subsequent surface enhancing process such as curling or ageing on a production line.

The Masa XL 9.1 is additionally equipped with an automated mould changing system, which reduces downtimes substantially when changing moulds, thereby making production more cost-effective.

Röckelein, themselves, assumed responsibility for creating the machine pit and erecting the frame structure for the block making machine. This very solid, structurally oversized construction has deliberately been made in this way to ensure that compaction energy is transferred optimally to the concrete in the mould without any real loss in vibration energy.

Rotho noise protection enclosure with gallery

The Masa XL 9.1 concrete block making machine was enclosed to reduce noise in the production hall. Noise reduction to under 80 dB(A) was attained by employing special noise protection elements from Rotho. The overall cabin height is 7,500

The mobile transfer table takes freshly-made products on the wet side

The curing rack – a giant-sized climatic chamber

mm and its large absorption area also makes a contribution to better noise insulation.

The noise protection housing was in any case built with enough height and space to permit the creation of an additional accessible gallery above the concrete block machine. This newly developed concept permits both a very good view of the Masa XL 9.1from above during production and an excellent means of observing all sequences, such as concrete being transferred from the conveyor belts to the storage silos and the functioning of the multicolour system. The gallery also makes it possible to clean the concrete block making machine easily and safely from above.

Multicolour system for individual concrete block surfaces

The multicolour system with hydraulic metering gate allows quite individual concrete block surfaces to be produced. The control unit and recipe management in combination with the metering gate enable high-class coloured products to be reproduced with the greatest accuracy.
The control station has been installed in a central position in the facility so that a clear overview of both production and dry sides is possible. The control panels have been fitted out with 24" TFT monitors, on which all functions and processes can be visualised with three-dimensional animation.

"Powertainer" and "Hydrautainer"

Masa has housed the entire hydraulics for the system in a noise-insulated container, the Masa Hydrautainer. All electrical switching cabinets are also installed in a central position in their own container, the Powertainer. All containers are linked together in the operating room for the overall system. This concept makes for a well-protected, clean site and is easy-to-assemble and customer-friendly on top of that.

Non-stop concrete supply

The concrete block making machine is supplied from both mixers with facing and core concrete via movable conveyor belts. The concrete is discharged directly into the two storage silos, one for facing concrete and the other for core concrete, thus assuring continuous production for high-class coloured products.

Multicoloured concrete slabs up to 60 x 40 cm

Production takes place at Röckelein on softwood boards made by Eckart Holz.
Before being inserted into the concrete block making machine, the boards are sprayed with release agent at the oil spraying station to be made ready for production. Besides concrete paving blocks, the Masa XL.9.1 also produces concrete slabs up to 60 x 40 cm and a height of 5 cm at Röckelein.

The curing system's total capacity is 7,932 boards

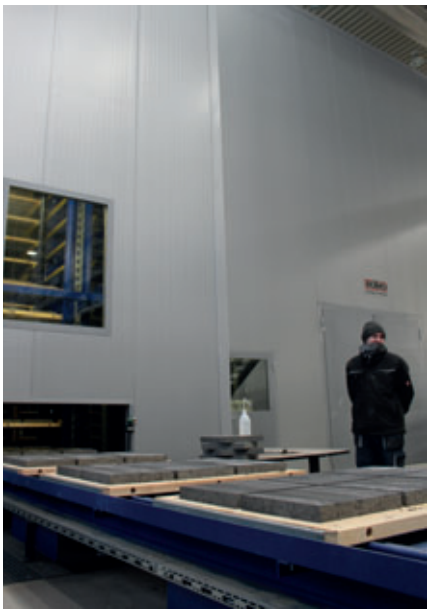
The fresh products travel via the approximately 18 m long mobile elevating conveyor to an elevating frame and are subsequently stored in the Rotho rack system (22 levels, 13 tonnes load-bearing capacity). The surfaces of these fresh concrete products can still be coated on the wet side, if needed, by travelling through a spraying system during transportation.

Rotho curing rack with giant-size climatic chamber

The curing system's total capacity is 7,392 boards; this entire giant-sized climatic chamber has been insulated including the transfer table area. Heat and moisture are exploited from the hydration process with the blocks and the Rotho circulation system generates a uniform climate. The circulation system is set up modularly and can be later expanded with a Rotho ProCure System (heating and moisturising), if required.

The Rotho circulation system generates a uniform climate

Transfer table and finger car system with intermediate storage



The boards are transferred by the lowerator individually to the mobile elevating conveyor on the dry side

Transfer table and finger car system with intermediate storage

A finger car unit with a turning device takes charge of the fresh products still on their production board in the drying chamber and brings them to their predetermined positions in the rack for curing.

The rack system provides room for 7,392 boards in 14 chambers. The reason for this high capacity is that products which still have to be finished in the following KBH system have to be cured for a longer time than those which are sent directly for packaging.

A finger car system with intermediate storage has been installed in front of the lowerator on the dry side. This means that concrete products can be continuously fed to the dry side, even if the finger car group is in the process of storing fresh products. The boards are transferred by the lowerator individually to the mobile elevating conveyor on the dry side. After optical quality control, the concrete products are taken by the Cuboter and either stacked in layers to generate packages of blocks on wooden pallets on a transportation track set up in parallel or else proceed one station further, where they are placed on the finishing line in layers by the transfer device.

The Masa Cuboter – efficient and based on material requirements

The entirely servo-controlled packaging unit takes block layers from differing pick-up positions and sets them down on the transportation track to make a packet. A feed-in conveyor thrusts a transport pallet, on which the block package will be securely transported and packaged, from the stack onto the transportation track.

Completed packages of blocks then run through a foil application device and in the following stages are strapped round horizontally and/or vertically depending on product. A transfer device at the end of the transportation track removes these strapped packages and places them on a package conveyor, which has been set up at an angle of 90° and which conveys the packages of blocks to the outdoor area. The packages then travel to their outside storage area by means of a forklift. The last package conveyor is almost 24 m long, in this way providing sufficient intermediate storage in the outside area until the packages are removed, so that the production line inside is not interrupted if the forklift is being utilised in the warehouse.

Concrete products manufactured on the Masa system possess a very dense surface structure

View of the dry side

Monitors with 3D visualisation also provide a complete overview of the dry side

Masa transfer device

Masa Cuboter: The entirely servo-controlled packaging unit takes block layers from differing pick-up positions and sets them down on the transportation track to form a package

Another Masa transfer unit takes the strapped packages of blocks and places them on a package conveyor set up at an 90° angle

Z turner

Empty boards are turned by the Z turner so that their surfaces are worn uniformly and stacked by a chain conveyor for stacking production boards. A pallet transporter takes full stacks and brings them automatically back to the concrete block making machine or else places the stack in an intermediate storage rack.

Rotho supplied their complete programme for the new concrete block making line

Including the intermediate board storage rack and central dust extraction unit in addition to the noise protection housing and the giant-sized climatic chamber, Rotho has supplied its complete programme for the new Röckelein concrete block making system.

Rotho intermediate board storage rack

1,680 boards can be held in temporary storage in the intermediate board storage rack, if high products like e.g. kerbstones are being produced. Only every second level is then utilised in the curing rack. Consoles are mounted on the rack rails' supports to ensure the greatest tolerance in movement for the board stack possible. This enhances process safety so that damaged production boards and board stacks standing at an angle do not cause damage to the supports in the course of time.

Rotho central dust extraction unit

The Masa concrete block making machine, the board brush and the ageing plant are all connected to the dust extraction unit. The control unit was purposefully installed to only extract dust at machines actually in operation so that energy costs are reduced to a minimum. The result is a practically dust-free manufacturing process and with it improved working conditions for employees.

KBH all-purpose processing line

The all-purpose processing line delivered by KBH to Röckelein is composed of a dancing-weights ageing system in combination with

Masa Z turner

Masa chain conveyor for stacking production pallets

A pallet transporter takes full stacks and brings them automatically back to the concrete block making machine or else places the stack in an intermediate storage rack

Rotho central dust extraction unit

a double curling unit. Both system components permit processing to be carried out singly, i.e. as pure ageing (curling brushes raised) or only curled (Dancing Weights retracted) and obviously in a combination of aged and curled.

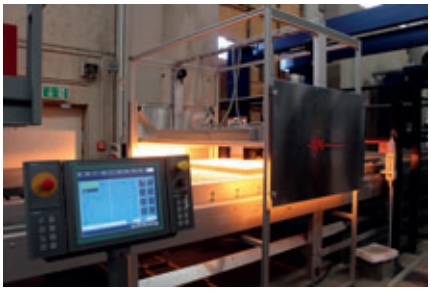
The finishing line was integrated into the Masa line. Around 20 per cent of the production will in future pass through this all-purpose processing line on the dry side. Cured products are lifted in complete layers from their production boards by a transfer device, transported to the finishing line and set down in front of the processing system. The complete layer is then thrust into the KBH system by means of a pushing device.

KBH Dancing Weights ageing system

The KBH Dancing Weights system with its noise protection enclosure is suitable for practically every block format (including multi-format slabs, circular sets, and polygonal blocks). They can be aged in layers fully automatically. Process intensity can be individually adjusted, thereby eliminating

KBH Dancing Weights ageing system

KBH double curling unit



Hardening the protective coating under UV light

any manual sorting after the ageing. Cycle times are between 9 and 15 seconds, depending on version and field of application.

KBH Dancing Weights ageing systems can be employed both inline and offline; they are also available in a mobile version.

KBH double curling unit

The KBH double curling unit can be employed in finishing all concrete products. It cleans "aged" products and generates smooth surfaces right up to a shiny appearance.

The free floating curling brushes adapt themselves to discrepancies in product height, no matter if they are transverse or diagonal. Its modular construction method allows the unit to be easily integrated into existing production facilities.

Coating sealed

Once finished, the concrete products can still be sprayed with a protective coating. This coating is then hardened directly under UV light in the following station.

No problems in offline finishing

Packages of blocks can be fed into the finishing machine for production offline via a feed-in conveyor from outside. The same transfer device, which moves the concrete blocks in layers from the transportation track behind the curing chamber onto the finishing line with inline processing, removes the blocks in layers from their stack. Their now empty transport pallet is fed back into pallet storage by means of the pallet feed-in conveyor. This means that the concrete blocks do not have to be brought into the hall for offline finishing. They are automatically transferred from outside, finished, repackaged and then conveyed again outside on transport pallets.

Geared up for the future with an ultra-modern manufacturing line for concrete products

The new concrete block line from Masa has been intentionally built in an extremely compact way and possesses a very high degree of automation that cuts down journeys with a forklift or similar transport vehicles to a minimum. Loading the finishing line for offline operations is carried out automatically from the outside. Neither is the below-ground discharge conveyor for production waste a commonplace feature.
And if perhaps a component should have to be replaced, it can be easily removed with the hall crane and carried over the curing chamber to the free hall area behind the curing chamber. This means that heavy equipment does not have to enter the actual production area.

View the video of Röckelein's new concrete block making machine at their site in Rattelsdorf:

www.cpi-worldwide.com/en/cpi-tv/video/Roeckelein

Simply scan the QR code with your Smartphone and watch the video!

It can be clearly seen that the expertise from decades of practice has been invested into the planning of this system. It is equally in evidence with the dirt extraction unit and the noise protection enclosure, which together make for appreciably more pleasant working conditions. It can also be noticed in the extensive safety devices in all areas of the facility. Occupational safety is of paramount importance at Röckelein.

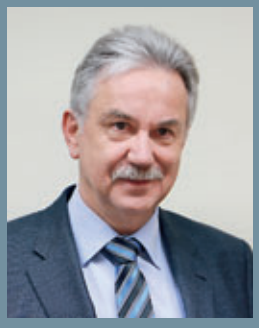
Very good collaboration with the companies involved

The managing director at Kaspar Röckelein KG, Mr Wolfgang Röckelein, was also very

An era ends at Masa

Rudolf Buyna succeeds Klaus Wilms

On 29th January 2016, Mr Klaus Wilms, an employee of long-standing at Masa GmbH in Andernach, departed into well-deserved retirement. More than 40 years ago, Mr Wilms began his activities there as a student trainee in the Masa founding company in Neugasse, Andernach. It was here that Alois Smaritschnik had formerly commenced his metalworking shop, which would produce Masa, a global company, in the course of the following decades.
Klaus Wilms has shaped Masa's success story from the 1970s until the present day. What is more, he made major contributions to many developments at Masa. His last activity was in sales as marketing manager for Germany/Benelux where Mr Wilms was responsible for supporting numerous European customers over a period of many years. The executive management at Masa GmbH, expressed its thanks on behalf of the entire company for Mr Wilms' great commitment and faithfulness throughout the years as well as for what he had achieved. "Not just Masa, but the entire industry will miss one of its veterans. We wish Mr Klaus Wilms all the best and good health for the future."
Mr Rudolf Buyna will now take over the sales area that Mr Wilms formerly oversaw. Mr Buyna completed his electro-technical vocational training more than 30 years ago at Masa. After finishing his training and various activities abroad, Mr Buyna worked in electrical engineering design before assuming leadership of production in the electrical engineering department. In 2011, he changed to sales and first took care of the Southeast Asia/Africa sales areas as well as parts of Europe. Mr Buyna has been working more intensively together with Mr Wilms for the last couple of years in order to assure that the changeover goes without a hitch. With Mr Buyna, customers can once again count on a competent and reliable reference person.



Klaus Wilms

Rudolf Buyna

Mr Wolfgang Röckelein (middle), his son Christoph Röckelein (right) and Mr Klaus Wilms (left) from Masa are very pleased with the way the project has been carried out

pleased with the way the project was carried out: "All the companies involved worked hand in hand so the project progressed well all the time. This applies both to our people, who laid the foundation for the machine, for example, and as well to all suppliers."

Efficient production

At the bottom line, the system's efficiency is of primary importance. Approximately 400,000 cycles a year have to be carried through in double-shift operations to be able to supply a delivery area with a radius of about 150 km.

The output performance of the KBH finishing line has been harmonised with that of the Masa concrete block making machine so that there will be no brakes on production should demand increase for highly finished concrete goods.

Röckelein products are greatly appreciated and the company has successfully achieved a strong market position through a mixture of experience and innovative spirit, tradition and progress as well as commercial wisdom and a readiness to take on evaluated risks. The company has not ceased developing successfully up to the current time. The commissioning of the new concrete block production in its Ebing production facility at its Rattelsdorf site marks a brilliant new highlight in its progress.

FURTHER INFORMATION

Kaspar Röckelein KG
Baustoffwerk Ebing
Bamberger Str. 181
96179 Rattelsdorf, Germany
T +49 9544 94900
F +49 9544 949050
verkauf@roeckelein.de
www.roeckelein.de

Eckart Holz GmbH
Holzbe- und -verarbeitung

Eckart Holz GmbH
Kallbachstrasse 48
36088 Hünfeld-Michelsrombach, Germany
T +49 6652 2577
F +49 6652 5555
info@eckart-holz.de
www.eckart-holz.de

KBH Maschinenbau

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KBH Baustoffwerke Gebhart & Söhne GmbH & Co. KG
Einöde 2
87760 Lachen, Germany
T +49 8331 950347
F +49 8331 950340
maschinen@k-b-h.de
www.k-b-h.de

LIEBHERR

Liebherr-Mischtechnik GmbH
Im Elchgrund 12
88427 Bad Schussenried, Germany
T +49 7583 9490
F +49 7583 949399
info.lmt@liebherr.com
www.liebherr.com

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masa
Milestone to your success.

Masa GmbH
Masa-Straße 2
56626 Andernach, Germany
T +49 2632 92920
F +49 2632 929211
info@masa-group.com
www.masa-group.com

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ROTHO

Robert Thomas Metall- und Elektrowerke GmbH & Co. KG
Hellerstraße 6
57290 Neunkirchen, Germany
T +49 2735 788 0
F +49 2735 788 559
sales@rotho.de
www.rotho.de

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