

Hess Group, 57299 Burbach-Wahlbach, Germany

## Significant increase in capacity and new, customer-specific products at Ebema

With innovations to success – in keeping with this motto the Belgium-based company Ebema (Edel Beton en Material) has developed into one of the top suppliers of concrete goods for garden and landscape construction as well as for road construction. The company is considered to be one of the trendsetters in the industry and is known beyond the national borders for its quality products. Ebema produces at two locations in Belgium, in Zutendaal and in Rijkevorsel. The former is also the company's headquarters, with administration buildings and a 17-hectare production site. The adjacent Albert Canal is a great advantage especially for the delivery of raw materials, since these can be brought in large quantities by ship almost up to the storage bunkers. And large quantities are required, because Ebema produces in seven workshops with a total of 9 machines and in some cases in three shifts per day. In order to increase capacities for the production of high-quality concrete paving stones and slabs, Ebema has just invested a total of €18.5 million in a complete new concrete block production line. The investment encompasses a newly erected production workshop with office and production plants. Ebema chose a concrete block making machine of the type Multimat RH 2000-3 MVA from Hess. In addition to the concrete block making machine, Hess was also responsible for all the transport and handling systems on the wet and dry side and has installed an impressive concrete block production line at the Zutendaal site, making use of the very generous amount of space in the newly erected workshop. The plant was officially inaugurated at the beginning of October 2013 and this step was fittingly celebrated a few days later with an 'Open Day'.

■ Mark Küppers, CPI worldwide, Germany ■

The history of the Ebema company starts in the year 1946. At that time the company began as a building material wholesaler. Ebema quickly developed into one of the leading manufacturers of concrete products. The family-run company has been in the ownership of the Panis family since 1976 and currently employs 211 people, of whom 124 work in the production.

Thanks to the experience and knowledge gained over many years, Ebema has reached the level of know-how that makes the production of very high-quality concrete products possible at all and leads to lasting success. Ebema is one of the first choices in

Belgium where high quality standards and contemporary design are to be united in concrete goods. It is therefore not surprising that Ebema has been able to secure permanent markets in the public and commercial sectors.

Ebema is represented by two brands on the market. Products for road building are sold under the company name Ebema. These also include, for example, dyke stones for water ways, drainage systems, chequer bricks and precast concrete boxes in dimensions up to 2.80 m.

Products for garden and landscape construction, conversely, are marketed under the name Stone & Style. The emphasis in

the Stone & Style range is placed on high-quality concrete paving stones and slabs measuring up to 1.00 x 1.00 m.

The finished products are normally transported by truck just in time according to the customer's wishes. In isolated cases, however, the canal connection can also be used, for instance when transporting large quantities of dyke stones, which can be taken by ship virtually to the place of installation. In addition to the main Belgian market, Ebema also sells its concrete products in the Netherlands, Germany and France. The top-quality products are also transported over greater distances, while the standard products are sold within a radius of about 150 km.



The 17-hectare Ebema works site in Zutendaal

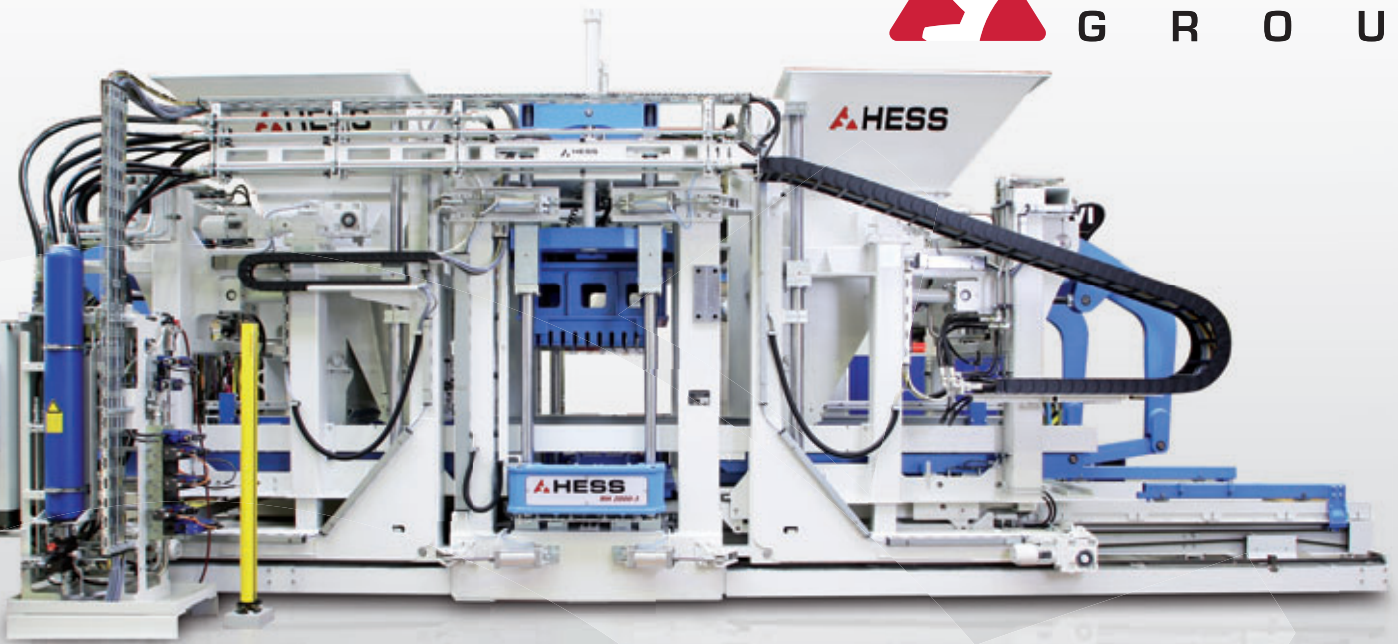


90% of the aggregates are delivered to Ebema by ship

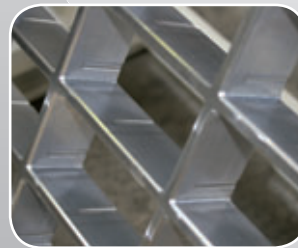


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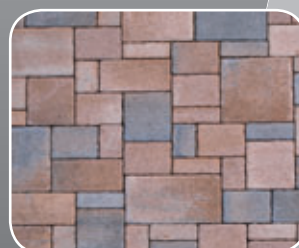
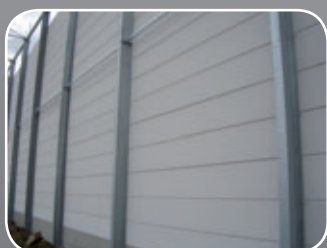
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*Mixing tower of the new production workshop*

As opposed to the general problems resulting from the economic crisis, which hit many concrete plants in Belgium hard, Ebema was virtually unaffected by these developments. Although the constant growth figures of the previous years were also briefly slowed at the peak of the crisis, Ebema did not suffer a slump like many of its competitors. In fact, the highest annual turnover in the company's history was achieved in 2011 with €44 million.

The chairman of the board of Ebema, Mr. Jan Panis, is certain that Ebema was able to stand up to the crisis with quality and innovations. Jan Panis is the present head of the



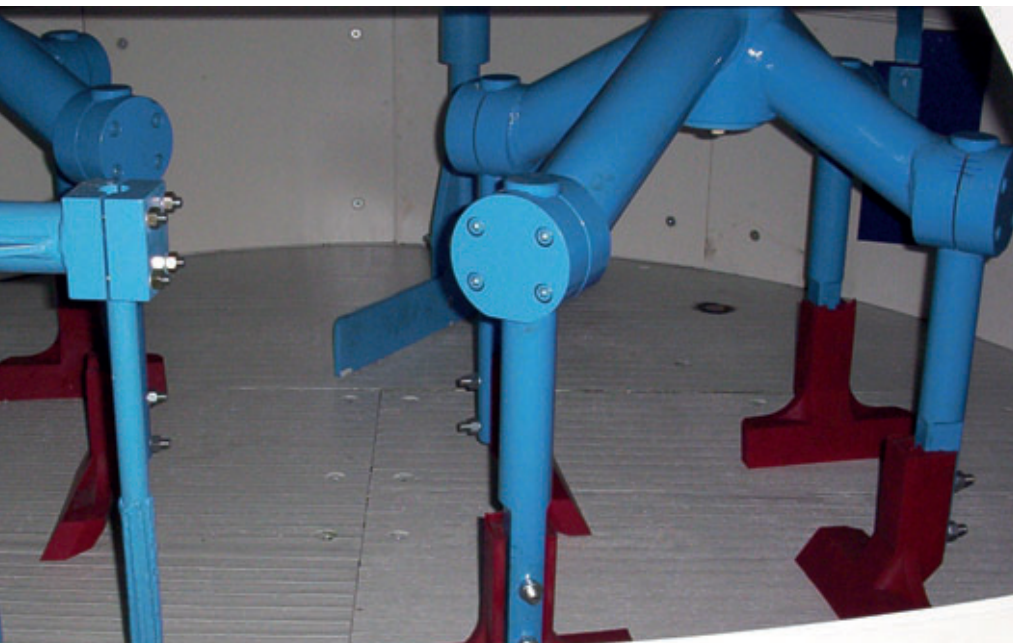
*The two SM 3000-2 compulsory mixers from Schlosser Pfeifer*

company. His brother Ludo still helps where possible following his retirement after years of success as the head of Ebema.

Great importance is attached to the working climate at Ebema. As mentioned above, Ebema is a family business and that is also put into practice. The close integration in the processes and high valuation of all employees has over the years created a climate that is surely not commonly found. That is also expressed by the regularly published employee magazine, 'Ebemagazine', in which both general information on the business as well as all kinds of private things about the employees can be read.

Ebema also employs a similar model in its dealings with its customers. The tie with the customer consists not only of the sale of concrete products; in fact Ebema strives to achieve a close partnership based on mutual trust in which both sides take responsibility for possible problems. Hence, solutions are sought from the very outset so as not to leave the customer alone with possible problems.

These efforts also pay off for Ebema elsewhere. For instance, Ebema has already won the national Belgian award as best supplier twice. This title is awarded by customers who can select their favourites in the industry.

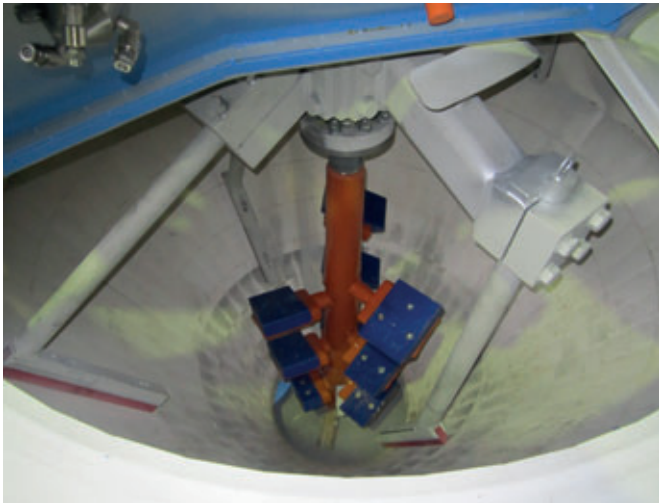


*Mixing tools of the SM 3000-2 compulsory mixer from Schlosser Pfeifer*



*The facing concrete mixer from Kniele*

The dosing experts!



Due to its funnel shape the Kniele mixer can be emptied very well by the force of gravity alone



The belt conveyors from VHV Anlagenbau transport the concrete from the mixers to the concrete block making machine

Of Ebema's two locations, Rijkevorsel is small in comparison with the dimensions of the Zutendaal location with its 17 hectare works site that runs for 1000 m parallel to the canal.

This site in Zutendaal has now been extended by the new workshop, in which the new Hess concrete block making machine is to provide



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*The transfer device places the production boards of a package on the board intake of the block making machine*

for significantly higher capacities in the planned three-shift operation. However, higher capacities were not the only things on Ebema's wanted list: it must also be possible to manufacture new products on the plant. At the same time, customer-specific wishes are to flow more intensively into production.

The result of the new building is the perfect integration of a new production line into the existing production structures. The concrete

block making machine from Hess put into operation here is the first plant from Hess that has ever been put into operation at Ebema. However, Jan Panis was convinced straight after the first test runs that he had made the right decision with the new plant.

**Significant increase in capacity and new, customer-specific products**

The new mixing tower was integrated into the newly erected workshop with its floor area of over 5,500 m<sup>2</sup>. Five double-chamber cement silos offer sufficient capacity for various types of cement. This allows Ebema to react flexibly in line with demand for core and facing concrete in the concrete recipes. Cement and dyes are both delivered by truck.

The aggregates on the other hand, as already mentioned, are mainly brought by ship to the Ebema works site. The aggregates are stored centrally in a total of 35 silos. This large number of different aggregates means that Ebema can always manufacture the optimum concrete for its wide range of products. The raw materials are also purposefully used by Ebema for colour support. Hence, the correct aggregate sizes are mixed into the concrete in the matching colour from the start if possible.

The aggregates are transported from the central silos to the higher mixing level by means of belt and steep conveyors from VHV Anlagenbau. The dosing containers of the two core concrete mixers and the facing concrete mixer are fed by the subsequent conveyor and distributor belts. Colour slurries give the facing and core concrete the desired colour.

**Two planetary compulsory mixers from Schlosser Pfeiffer for non-stop core concrete**

For the production of the core concrete Ebema opted for two compulsory mixers of the type SM 3000-2 from Schlosser Pfeiffer (Hess Group). The two mixers with a compacted concrete output of 2 m<sup>2</sup> per batch allow Ebema to supply concrete continuously to the new concrete block production line. If the product is changed, in particular where a change of colour is involved, one mixer can be cleaned while the other is running. The change of colour is thus quite simple and running production need not be interrupted. Product and colour changes are therefore not a problem for Ebema in any phase.

Mixers from the SM series from Schlosser Pfeiffer are suitable for manufacturing concrete for the entire range of products of a classic concrete plant, regardless of whether those products are concrete blocks and slabs, products for underground construction such as pipes and manholes, precast concrete elements for building construction or ready-mixed concrete. Thanks to their high mixing intensity, planetary compulsory mixers are particularly suitable for concretes with a low water cement ratio as well as for earth-moist concrete and self-compacting concrete.

The mixers from Schlosser Pfeiffer are developed and designed on modern 3D CAD systems. Materials and components that meet the highest requirements and whose quality is ensured by the company's own regular checks are used without exception in the production. The mixers of the type SM 3000-2 have two main drives.



*Hess Multimat RH 2000-3 MVA*



*All components that are subject to stress are of a particularly sturdy design in the Multimat from Hess*



The production boards with the fresh products are transported to the hardening chamber by the V-belt conveyor.

#### Facing concrete mixer from Kniele

For fast changes of colour the facing concrete mixer was to have an automatic mixer cleaning system: that was one of Ebema's criteria in choosing this mixer for the new concrete block production line. Following the positive experiences had with the first two facing concrete mixers from Kniele, which have already been in service for some time at Ebema, the decision was quickly taken to acquire a third Kniele mixer for the new production line.

The agitator of the Kniele mixer is made of polyurethane, including the PU coating of the screw pipe. As a result there are practically no concrete adhesions and the mixer is very easy to clean. The cera-



The SHV 500 block height measuring system from R&W Industrie-automation monitors the height accuracy of the fresh products.



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*Transport system on the wet side*

mic lining of the entire mixer not only has very good wearing characteristics, but is also a great advantage when cleaning.

Two systems were installed for the cleaning of the cone mixer. An automatic high pressure unit from Kniele is responsible for the final cleaning of the mixer. An automatic rinsing system, for which application for a patent has been made, enables cleaning of the mixer within only about one minute, so

that a colour change can be accomplished quickly and easily. In addition, considerably less water is necessary for this cleaning, since in theory it can be used again and again for the cleaning.

Due to its funnel shape the mixer can be emptied very well by the force of gravity alone. Subsequent mixtures can thus be produced without residues from the preceding mixture.

**Wet and dry side – high performance in all areas**

The concrete is transported from the mixers to the block making machine by a technically sophisticated conveyor belt solution that is accessible at all points and is also manufactured with belt conveyor technology from VHV Anlagenbau

**Hess Multimot RH 2000-3 MVA with fast mould change**

The core component of the new concrete block and slab production line at Ebema is the Multimot RH 2000-3 MVA concrete block making machine with fast mould change from Hess. In addition to high performance, Ebema wanted a machine that can be converted quickly. With the mould change system from Hess the moulds can be changed quickly and automatically. Since this procedure normally takes place in less than 5 minutes, downtimes when changing products are very limited and several changes of mould in one production day are not a 'no go'.

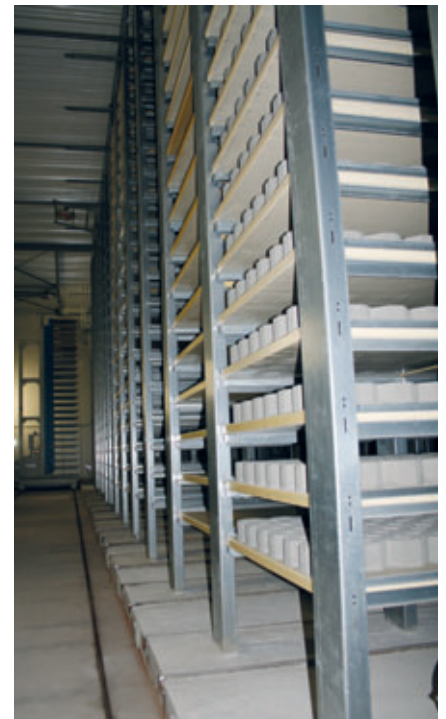
The concrete block making machines from the Multimot RH 2000-3 MVA series are the largest and most powerful concrete block making machines from Hess. Hess' many years of experience in mechanical engineering combined with the latest technological progress are reflected in these machines. With the Multimot RH 2000-3 concrete block making machine, Hess promises the customer simple operability with high safety



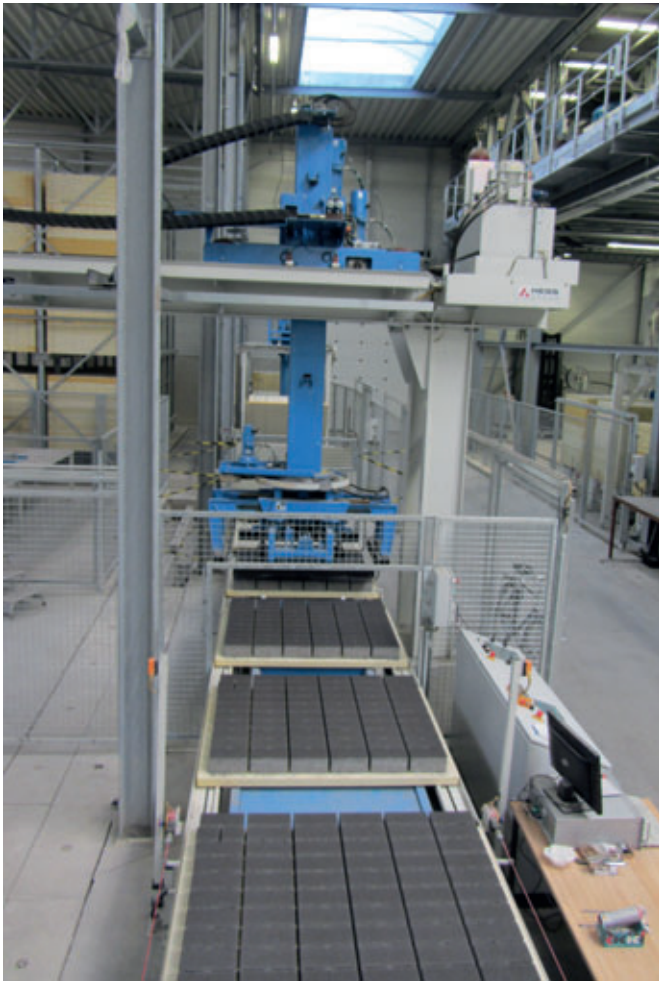
*The elevator can accept up to 22 production boards*



*Finger car in operation*



*The curing rack from Rotho offers space for up to 6,776 production boards*



Dry side with Servo 700 packet assembler

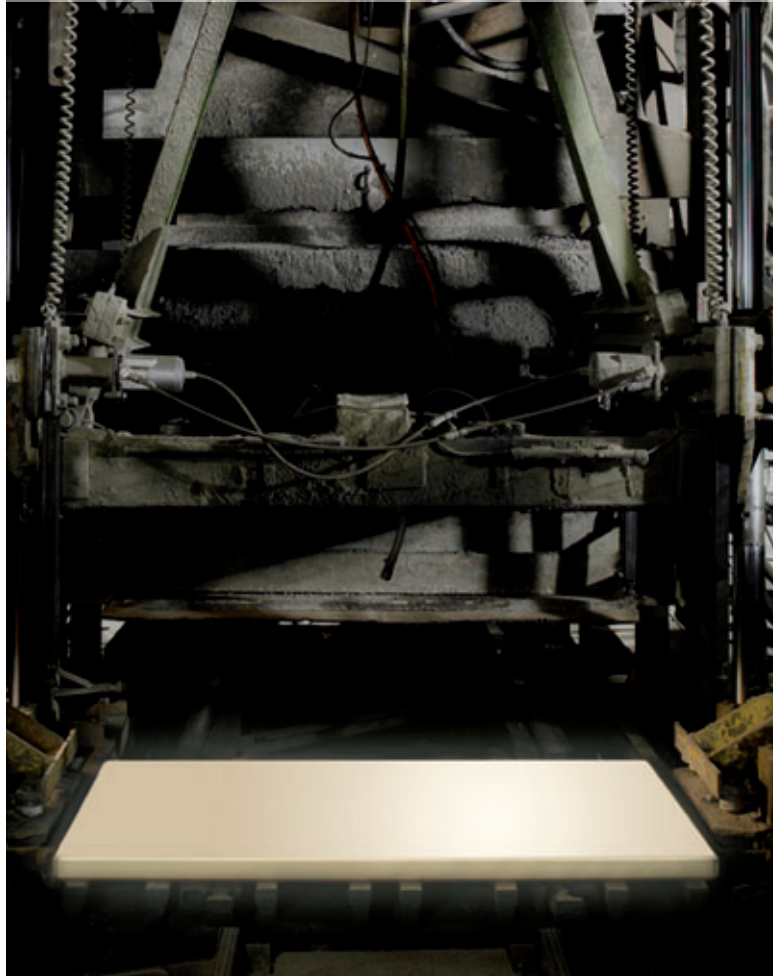
standards and a high level of economy – arguments that were also convincing enough for Ebema to put the first Hess plant into operation at the company. Inspections of reference plants and the complete package offered by Hess did the rest.

In the Multimat from Hess all components subject to stress are of a particular sturdy design and the plant is equipped with the modern control and visualisation systems Siemens S7 and Siemens Win CC. The hydraulic MAK8 controller from Bosch Rexroth ensures fast, repeatable movements of tamper head, mould and feed box. The complete plant is naturally enclosed by a sound insulating cabin and is equipped with the latest safety technology. From the control centre, which is positioned directly adjacent to the sound insulating cabin, the Multimat RH 2000-3 MVA can be directly observed during operation through the large glass pane. In addition, all other events in the works can be followed and controlled on the monitors in the control centre; everything can be centrally observed, from the concrete production to the packaging.

#### SHV500 block height measuring device from R&W

For the monitoring of the high product quality demanded, the fresh products pass through a block height measuring device immediately after production. R&W Industrieautomation GmbH installed an SHV500 in Zutendaal, which has proven itself in numerous concrete plants. The block height measuring device from R&W Industrieautomation GmbH operates precisely and simply. With the aid of laser distance sensors the system enables contact-free height measurement of concrete blocks and provides important production data.

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The SHV500 is designed to measure all common concrete block products with a height range of up to 490 mm. Thanks to the very fast HSC500 sensors, products can also be measured accurately even at high conveying speeds.

The heart of the SHV500 is the HCS500 height sensor from R&W. This is a high-resolution laser distance sensor with a measuring frequency of 2500 Hz, which is equipped with a high-performance microcontroller. All components required for determining the block height are integrated in the sensor. The sensor only needs to be connected to a network and a power supply and can be operated autonomously. The measured values can be displayed using the integrated web browser, which provides the results in graphic form for a standard web browser.

**Ebema opts once again for production boards from Assyx**

The concrete products of up to 500 mm in height that can be manufactured with the Multimat RH 2000-3 MVA are produced on production boards of the type DuroBoard from Assyx. Ebema has already twice ordered 4,000 production boards of this type from Assyx for its other production lines and has increased the number by a further 4,000 for the new production line, making a total of 12,000 DuroBoards that are now in use at Ebema.

Ebema wanted the largest possible production board for the new production line. The production boards supplied have a size of 1,500 x 1,250 x 60 mm. With this size the weight advantage over hardwood also bore fruit for Ebema. In the DuroBoard the laminated core of pinewood is encased in a sheath of specially developed polyuret-

hane. The closed and smooth polyurethane sheath is durable and oil-resistant. The use of oil-based release agents does not cause any damage to the board even in long-term use.

The production boards are automatically fed to the concrete block making machine. A board-stacking conveyor is installed in front of the sound insulation cabin of the concrete block making machine and brings the DuroBoards in packages to the Hess Multimat by means of chain conveyors. The board transfer device installed at the end of the conveyor takes one production board per cycle from the stack and sets it down on the parallel running V-belt conveyor, which then transports the board to the block making machine in the sound insulating cabin.

The board stacks are transported to the board-stacking conveyor on the wet side by a board finger car specially installed for handling them and are transferred there. The finger car fetches the board stacks directly from a second board-stacking conveyor on the dry side. After the packet assembler has removed the concrete products from the production boards, the boards are brushed, sprayed, turned and then stacked by a transfer device to form a package. These stacks are taken up by the finger car and are then either fed directly back into the production or temporarily stored in the board buffer rack, which can hold 2,625 production boards. If the dry side cannot supply as many production boards as are required on the wet side at this point in time, the finger car serves itself analogously from the board buffer rack and in this way ensures the continuous supply of boards to the production.

This board finger car also brings the concrete block moulds from the mould rack to the quick-change system of the Hess Multimat RH 2000-3 MVA and/or takes the exchanged mould back to the rack system, which is located behind the board buffer racks. Ebema mainly uses moulds from Rampf.

**Drying rack for 6,776 production boards**

The production boards with the fresh concrete products are output cycle-by-cycle from the Multimat RH 2000-3 concrete block making machine and placed on the almost 40-metre-long V-belt conveyor at whose end the production boards are collected by an elevator with a load-carrying capacity of 14 t. On the way to the elevator the fresh products will in future pass through a washing station, a blow-off station and an impregnation station.

Once the elevator is fully laden the Hess finger car in the drying chamber takes over the production boards – up to 22 boards, depending on the product height – with the fresh products from the elevator. The production boards are then taken by the finger car to the intended place in the rack and set down there.

The rack system was supplied by Rotho and can accept up to 6,776 production boards in 11 compartments, each with 28 drying chambers on 22 levels. The Rotho air circulation system provides for uniform hardening conditions by ensuring homogeneous humidity and temperature conditions in all drying chambers.

**Two lowerators on the dry side**

The finger car takes the production boards with the hardened products out of the rack



*The walking beam conveyor transports the block packages to the package transfer device*



*Servo 700 packet assembler from Hess on the dry side, mould rack and board buffer rack*

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Typical of Ebema: the new concrete products are stored in a dry place.

and drives with them to the two lowerators on the dry side. While lowerator I is transferring the production boards to the V-belt conveyor on the dry side, which then transports them to the packet assembler, lowerator II can directly serve an optional refinement line, which currently doesn't exist. At present the production boards are also transferred by lowerator II via a bypass to the V-belt conveyor for packet assembly.

Depending on the product group an automatic net dispenser places a protective net over a product layer in order to ensure optimum surface protection during the subsequent packet assembly.

The Servo 700 packet assembler from Hess picks up the product layer from a production board and places it on the walking beam conveyor installed at a right angle to the V-belt conveyor. Depending on the product group a wooden pallet from the pallet magazine is first placed on the walking beam conveyor on which the concrete goods are then stacked, or they are stacked directly on the walking beam conveyor.

As described above, the empty production boards are cleaned, turned and stacked in the following stations and then taken up by the Hess finger car of the board buffer rack. The product packages on the walking beam conveyor pass through a few more stations on the way to the workshop exit. These include a cover sheet dispenser, vertical and horizontal strapping stations from Cyclop and a shrink-wrap machine.

The block package transfer device at the end of the walking beam conveyor transfers the packages to a slat conveyor, which then transports them to the outdoor area. Onward transport to the storage places (these are normally all roofed over at Ebema) is done by fork-lift truck.

**Trouble-free commissioning and fulfilled expectations**

After the plant went into trial operation in summer 2013, the individual steps quickly meshed with one another and a smooth production operation was promptly achieved. At the official inauguration of the new production line on 2 October in the presence of well-known politicians, all invited visitors were able to see for themselves the high performance of the new concrete block production line and the high quality of the products. The new plant was then demonstrated to further interested parties at an open day a few days later.

The specifications and wishes of the Ebema management were implemented to the full by the suppliers of the individual plant components and in particular by the Hess Group as the main supplier. The high expectations, which the client is entitled to have with a project of this financial order of magnitude, were entirely fulfilled. Jan Panis was already very satisfied with the results following the production of the first products during the commissioning phase and his estimation was confirmed in the weeks that followed up to the start of full production. ■