Masa GmbH, 56626 Andernach, Germany

Short distances to success

The business relationship between the mechanical engineering company Masa GmbH and the building materials manufacturer Gebr. Zieglowski GmbH & Co. KG is evidence of a longstanding partnership at eye level. Both Masa and Gebr. Zieglowski have their roots in the north of the state of Rhineland-Palatinate in Germany. Since the middle of the 19th century, the pumice of volcanic origin found here has been used to produce Rhenish pumice blocks. The boom of the pumice industry that began after the Second World War, was fueled by the demand for pumice stones for the reconstruction of Germany until the early 1960s. The increasing degree of automation in the manufacturing process of concrete blocks since the 1960s have decisively shaped the stories of both companies: Masa made its way in the development and manufacturing of block making machines, while Gebr. Zieglowski was concentrated on the production of these concrete blocks. The portfolio of the two companies has been expanded over the last few decades with a promising future. Gebr. Zieglowski partnered with reliable machine equipment from Masa for the permanent expansion of their production facility.

The company Gebr. Zieglowski GmbH & Co. KG was founded in 1953 by four brothers. From the very beginning, Gebr. Zieglowski did not just focus on the production of pumice stones. In the postwar years, the supply of raw materials also had top priority. So, it made sense to promote the company's own pumice mining, raw material extraction, and raw pumice dispatch as a second pillar. Within a very short time, Gebr. Zieglowski was able to supply the first production facility with its own high-quality materials. Almost 70 years later, the company still has its own pits with extensive raw material deposits, which are mined layer by layer using modern equipment in an environmentally friendly manner. The consistently high standard of the raw material pumice is of course also reflected in the quality of the end products. The volcanic stones, like all other aggregates, are analyzed and tested in the in-house laboratory. In the meantime, Gebr. Zieglowski produces far more than "just" pumice stones. The company from Kruft, Germany, has specialized in building construction/residential construction made of lightweight concrete, concrete blocks for gardening / landscaping (shuttering blocks, slope blocks, wall systems, etc.) and concrete BoxBlocks for bulk material boxes or partition walls. In the past as today - the quality must be right.

Production facility of Gebr. Zieglowski GmbH & Co. KG in Kruft, Germany

The efficiency of the Masa production plant is also reflected in the existing storage space (over 200,000 m²).

masa

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Masa covers the complete range of machinery and ancillary equipment for the building materials industry: Batching and Mixing, Concrete Blocks/Pavers, Kerbstones, Concrete Slabs, Sand Lime Bricks and Autoclaved Aerated Concrete (AAC) Products.

All technical solutions are individually planned, designed, adapted and realised for each customer, resulting in one supplier and one individual contact person.

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Quality is not a coincidence

In addition to the use of impeccable raw materials, the manufacturing of high-quality concrete products requires one thing above all: a fully automatic production plant developed for the demanding quality requirements. For example, up to 5,000 m² of wall-building materials leave the Gebr. Zieglowski factory every day. The production plant must be perfectly designed and coordinated for this. Maximum precision with minimal tolerances for the large or small-format stones is what really matters.

At the center of the plant is an almost indestructible block making machine: The Masa Record 9001 was put into operation at the end of the 1990s. The Masa logo on the machine is a bit antiquated, but the quality of the products and the output correspond to the current manufacturing standard. This is possible because the equipment of Gebr. Zieglowski is continuously checked for its functionality and contemporary orientation and, if necessary, expanded and modernized.

Masa has been actively supporting the building material manufacturer in its modernization efforts for many years. In the last decade, a conversion of the dry side to integrate a QA-station with secured access, including the necessary control panel and power cabinet adjustments, as well as reprogramming have been implemented amongst other projects.

Masa Record 9001

Mixer PH 3000/4500 for main mix concrete

In addition, the entire mixing area was optimized. During this measure, the main concrete mixer, which was still installed above the block making machine in the original plant layout, had to be dismantled. The new location was designed with foresight in such a way that a later plant expansion to concrete products with a face mix layer can be implemented without any problems. As a first step, Masa delivered a new main concrete mixer PH 3000/4500 including a mixer platform, the Masa Aquados water dosing system, and other accessories. The massive, almost 25 t heavy PH 3000/4500 with planetary gear (equipped with three external 45 kW drive motors of energy efficiency class IE3) was completely refurbished in 2020. It stands for a combination of the shortest possible mixing cycles with very small wearing and a very high plant availability. The mixing is done by four robust mixing stars, which are arranged in different positions. Each mixing star has three streamlined mixing arms, with one mixing arm installed at a different height. The daily operation of the mixer PH 3000/4500 is also reflected in the durability of the mixing tools.

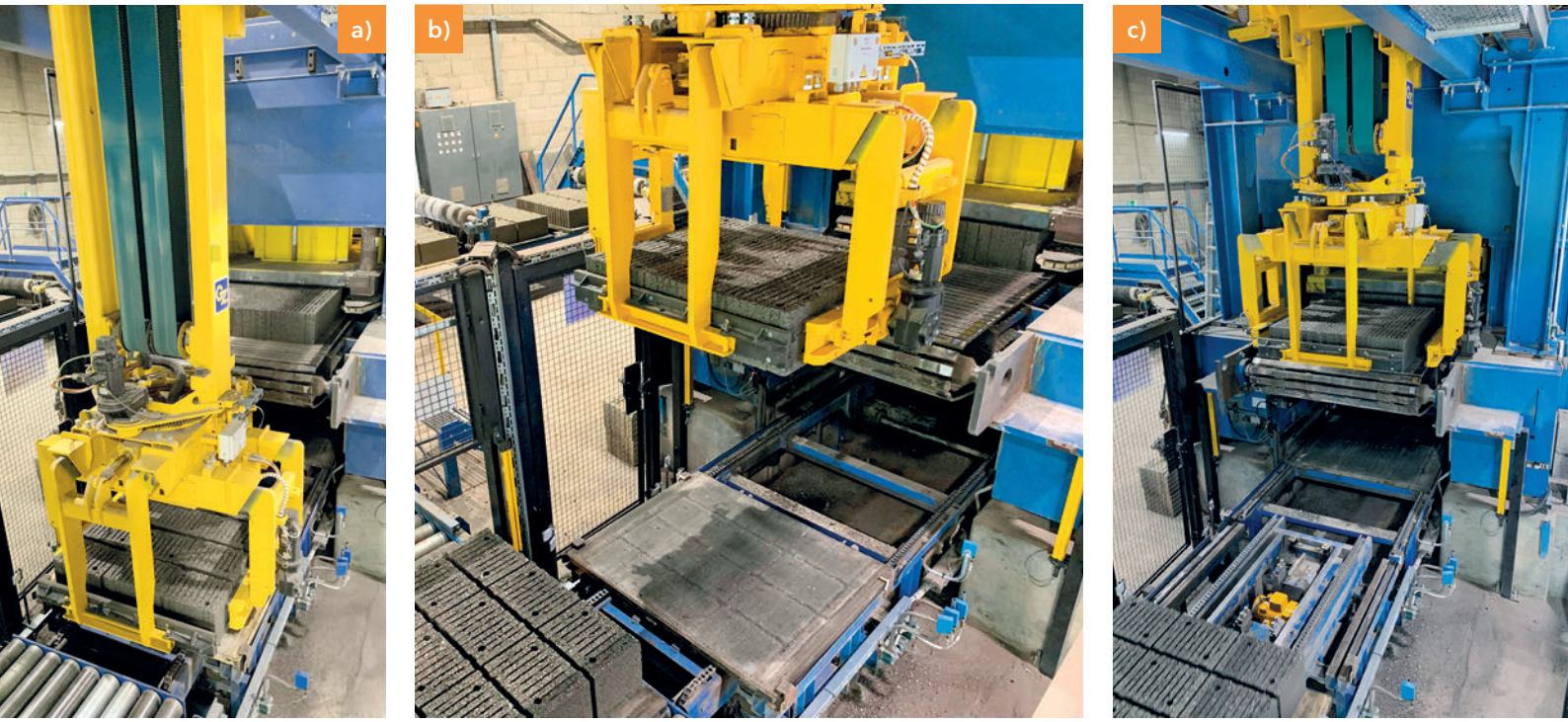
For the flexible transport of the concrete from the mixing plant to the silo of the block making machine, a Masa bucket conveyor was installed, which also allows a possible expansion to face mix concrete production. By equipping the bucket conveyor with a double bucket, the course was set in advance for a separate and therefore clean transport of the main and face mix concrete.

By retrofitting a Masa Multi color device "Easy", Gebr. Zieglowski achieved significant flexibility in expanding the product range. The device, which is mounted directly on the machine silo of the block making machine, is characterized by the minimal space requirement of a coloring system. In addition, Masa carried out a complete conversion of the control to the FAST visualization and S7 PLC, provided new power cabinets for the dosing plant and brought the comprehensive safety equipment back to state of the art in the block making machine area.

Transport of freshly produced thermal insulation blocks to the curing area or of cured blocks via the bypass modules to the grinding system.

Smart solutions in limited space

Another very extensive modernization and expansion measure was initiated in 2020 by Gebr. Zieglowski. The entire handling area after curing up to the cubing device should now be tackled. For Managing Director Thomas Zieglowski, the goals of these measures were clearly set: "By modernizing and optimizing the existing production facility, we want to make our production more efficient and increase the quality of the products even further. By installing a large board buffer with over 1,000 production boards, the so-called "wet / fresh side" is now decoupled from the dry side and thus from the production cycle. In the future, this will give us the opportunity to cushion production interruptions and make production more variable." The planning and implementation were carried out in close cooperation with those responsible for the project at Masa GmbH, Rudolf Buyna, Edgar Schmitz and Christoph Dirk.



Block loosener and Shifter I: The hardened blocks are loosened from the production board, centered, and gently placed on the feed belt of the grinding system.

The handling area had to be turned inside out for the project. The existing lowerator was dismantled and moved about four meters towards the fresh side. The hardened products now run over a bypass consisting of chain and roller conveyors in the direction of the return transport / dry side. Quality control as well as insertion of insulating material into the products can be carried out safely on the roller conveyor modules. The limited space was taken into account with another trick: the middle roller conveyor module can be mechanically and electrically decoupled and can be moved out for easier access between the fresh and dry side.

Immediately after the bypass modules, an ingenious interplay of four continuously servo-controlled layer shifters, a return transport (designed as walking beam conveyor), a grinding system arranged on the second level above the return transport, and a parallel line for layer remodeling begins. At this point we can rightly speak of a masterpiece that the technical offices of Masa GmbH planned and carried out. A stable system that meets all the requirements in terms of flexibility and functionality runs in a very small space. The newly delivered Masa Shifter I in portal design is equipped with a carriage, a lifting and lowering unit, main clamp, 4-sided clamp, vertical and horizontal turning device. The lifting weight is up to 1,000 kg. The individual action options of the Shifter speak for themselves: the centering of the products, the vertical turning of a layer, the horizontal turning of products and the transfer of the layer to the feed belt of the grinding system (in level 2) or to the return transport can be freely combined. The existing Masa block loosener, which is used to loosen any products that may have adhered to the production board, was also integrated into the process.

During the reconstruction phase: Assembly of return transport, Shifter III and IV as well as Cuboter

Picking up the grinded products and transferring them in layers onto the return transport.

The new control panel for the area of return transport and remodeling.

The existing 2-station grinding system and the Shifter II were also fully integrated into the process and safety technology. The entire stone layer is grinded (calibrated) here, turned 180° with the Shifter II and processed again by the second grinding station. The new Masa Shifter III removes the grinded products from the grinding system and puts them back to the return transport. Products that do not require any surface treatment can alternatively be carried out directly using a walking beam conveyor under the grinding system. The remodeling line can now be operated from the return transport as required. This is done by means of Masa Shifter IV with a horizontal turning unit. This Shifter can also handle lifting weights of up to 1,000 kg.

Masa remodeling: The original 10 thermal insulation blocks (16DF KLB SW1 thermal insulation blocks) of the production cycle are reduced to eight blocks to achieve the pallet size.

With the installation of a new Masa remodeling line, Gebr. Zieglowski was given modern equipment for enlarging or reducing stone layers in the process direction. The layers are remodeled using a combination of a pushing device, pneumatically driven hold-down device, and PVC belt. The remodeling unit is also designed for 1,000 kg per layer and supports the handling of the products according to individual requirements. By remodeling, Gebr. Zieglowski can produce about 25% more stones for certain formats at the same production speed.

An interface for connection to the ERP system is provided for monitoring production data, production planning, and operating data on the dry side.

Working tirelessly

In the past, a hydraulic Masa cubing device with two separately turnable stacking baskets was used to remove a complete layer of stones from the return transport and the remodeling line as well as to create cubes on the subsequent cube conveyor. This work is now carried out by the Cuboter, the contemporary solution from Masa GmbH. The fully servo-controlled cubing system can easily handle varying pick-up and set-down positions as well as height differences. Where previously two stacking baskets were necessary, the single basket Cuboter now reliably fulfills all work processes with dynamic, harmonious movements. The high load capacity of the Cuboter, which is already standard, has been adapted again for Gebr. Zieglowski. The lifting weight is a whopping 1,000 kg. The maximum package height has been increased to 1,500 mm.

In addition to the Cuboter, the existing cube conveyor designed as an underfloor chain conveyor with cube transport carts, a transport pallet storage magazine, and centering devices were integrated into the new control system for the cubing area. The signal exchange with two strapping machines (horizontal and vertical) and a shrink wrap machine was also integrated.

Intelligent interaction of return transport, Shifter, remodeling line and Cuboter

Cuboter in action

View to the packaging area

Safe transition in the cubing area

The cube transport carts are precisely positioned using a centering device. A new transport pallet centering station now ensures the exact placement of a wide variety of pallet models under the placement position of the Cuboter. The device makes a significant contribution in terms of transport safety because the pallet always sits optimally under the cube.

Another individual solution catches the eye at the Gebr. Zieglowski factory: the maintenance platform of the Cuboter. The Masa Safety concept takes into account the spatial conditions and customer requirements to a considerable extent. An approximately 10 m long maintenance walkway with appropriately secured stairs was installed along the Cuboter up to the hall wall, which can also be safely walked on while the Cuboter is in operation. Starting from the hall level in the area of return transport via the cubing level, safe and quick access to the switch cabinet rooms is possible. The Cuboter has a separate entrance, which is separately secured with a double sliding door and access requirements. The transport pallet storage magazine as well as the strapping machines and the shrink wrap machine were fully integrated electrically and mechanically into the safety concept.

Everything on its place in the new, air-conditioned, and dust-protected switch cabinet rooms

Flexibility through process optimization

The modernization measures in the so-called cross transport were also extensive. Above all, the new system was supposed to optimize the process and increase the efficiency and availability of the plant, so that the fresh and dry sides can work as independently of one another as possible. In parallel to the dismantling of the previous cross transport components, parts of the curing rack were dismantled for this purpose. This created space for the systematic buffering of a total of 1,680 production boards. Storage and retrieval logistics are based on the intelligent interaction of various Masa components. Directly behind the Cuboter, a lowering device takes up two production pallets one after the other, which are then clamped by means of a turnover device (Z type), turned by 180° and transferred to a collecting device that gradually cycles downwards. As soon as a stack of a maximum of 20 production boards is built, the collecting device lowers the stack completely and transfers it to the following transport conveyors. Both frequency-controlled buffer roller conveyors and chain conveyors are used here. When designing the entire area, the limited space capacity was once again considered: the chain conveyors are reversible so that the production boards can either be transported in the direction of the block making machine or storage rack. The Masa transport carriage regulates the storage and retrieval of the stacks of production boards in the storage rack. This consists of a track bound lower car as well as an upper car with lifting mast with fingers. The exact positioning/interlock of the lower car in front of the storage rack is effected by a centering device and centering rollers. The upper and lower cars do not communicate via trailing cables, but bidirectionally via a data light barrier. This wireless data communication represents

The turnover device (Z type) clamps two production boards each and turns them 180°.

The new Masa transport carriage for production boards.

a safe and reliable alternative with which large amounts of data can be processed efficiently. In front of the block making machine, the production pallets are automatically de-stacked by means of a combined lifting, clamping, and transporting process. Masa supplied a new board destacker for this.

Short distances to success

Gebr. Zieglowski clearly benefits from the implementation of the extensive measures. Short and well thought out routes within the production plant and close cooperation with responsible parties at Masa GmbH are decisive milestones as the concrete block producer in Kruft continues to be very successful.

Together, the companies Gebr. Zieglowski and Masa accepted and mastered the challenge of implementing such an extensive modification of the existing production facility during the pandemic phase. Thanks to the interaction of the Project Managers Thomas Zieglowski, Sven Wagner, Domenico Pullera (all GZ) and Rudolf Buyna, Edgar Schmitz, Christoph Dirk (all Masa), the project was successfully installed and commissioned within seven weeks. Last but not least, this was of course only possible thanks to the active commitment of the other employees of both companies who were directly and indirectly involved. ■

The company Gebr. Zieglowski was founded in 1953 and has had close ties to the market since then, is a founding member of the Federal Association of Lightweight Concrete, main shareholder of iNTERBiMS GmbH including the company KLANZ in Kruft and shareholder of Recycling Centrum Mittelrhein GmbH. Gebr. Zieglowski sells its masonry products through KLB Klimaleichtblock GmbH. KLB Klimaleichtblock is the sales company for three pumice building material producers and conducts research and development. The Neuwied Materials Testing and Research Institute is involved in this process.

FURTHER INFORMATION

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