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Flawless Hattrick: The Russian manufacturer Porevit shines with concentrated capabilities



The Russian based group of companies "Partner-Holding" is a market leader in a number of construction related industries in the Ural region; including the production of building materials, development planning, retail, and wholesale trade. In 2021 the Holding celebrated its 30th anniversary as the one of the oldest enterprises in the region in recent Russian history. The Holding consists of seven companies, including - as one of the main pillars- Yalutorovsk Building Materials Plant AO "KSM", that concentrates on the production of building materials for civil constructions. Under the umbrella of AO "KSM", there is also the enterprise Porevit, who operate the most modern plants in the Ural-West Siberian region to produce wall blocks from autoclaved aerated concrete, sand lime bricks, tongue-and-groove blocks, as well as concrete pavers. The production capacities of the plant are about 300,000 m³ of AAC blocks, 110 million of sand lime bricks and now also up to 900,000 m² of pavers per year. Located in Yalutorovsk, about 75 km southeast of Tyumen, the administrative center of Tyumen Oblast (Russia), the plant is equipped with three automated production lines manufactured by the German company Masa GmbH. The site covers an area of 16.8 hectares and is located close to raw material bases as well as important rail and road networks. Porevit is a

leading Russian manufacturer in the production of modern sand lime bricks, and its pavers have been added to the list of "Russia's 100 Best Goods."

The long-standing relationship between Masa and the "Partner-Holding" started in 2009 when the first Porevit plant for the production of AAC blocks was successfully installed and commissioned. Two years later, the production capacity of Porevit was expanded by the commissioning of a Masa sand lime brick plant with two hydraulic presses type HDP 800. A number of high-profile projects were constructed in Tyumen utilizing wall blocks produced by the Porevit plant including: The Wedding Palace, the International Terminal of the Roshchino Airport, School No. 63, the Geologist Sports Palace, and the Tyumen City Mall Shopping and Entertainment Center.

In 2020, Porevit again extended its portfolio with the purchase and commissioning of a new Masa concrete block manufacturing plant. This latest project was realized in cooperation with the well-known Russian paver manufacturer Vibor, under whose trademark the pavers are sold.

Today, Porevit is the only facility with three different production plants on the same site: sand lime bricks, AAC- as well



The Porevit Plants in Yalutorovsk: Successful partnership with Masa GmbH since 2009

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Production of sand lime bricks with the Masa hydraulic press HDP 800



Impressions of the Masa AAC production plant

as concrete products – all from one supplier, Masa GmbH. For Porevit, this was a deliberate decision: In the long-standing business relationship, Masa has proven to be a reliable and honest partner who is highly respected in the Siberian region. Of course, the high level of technical solutions offered by Masa was a key factor when deciding who to partner with for these projects. The Porevit plants are among the most modern facilities in the Ural region, as well as the entire CIS.

Pavers for superior demands: It all starts with the raw materials

The start of installation works coincided with the strictest shutdown measurements from COVID-19 in Europe and particularly in Russia. Despite that, the professional Porevit team collaborated with the Masa team to finish the successful commissioning of the plant on time. Since the end of 2020, the plant has been running at full capacity.

In the past, the local market in the Ural region had very limited access to high-quality pavers. Therefore, the plant's primary objective was to produce premium pavers in various shapes and colors and with different face mix materials, for which there is a real market demand.

The plant was specifically designed to achieve high outputs, which was a challenging task in light of the Siberian weather conditions.

Careful consideration was given to the raw materials and how to store them to ensure an efficient operation.

The basic concept was for the main mix and face mix materials to only meet in the mold during the compaction process. This helps to reduce unwanted mixing of materials while the concrete mix is being produced, reducing the chance for contamination in the high quality face mix.

Excessive water or ice in the raw materials can be detrimental to the production of high quality products. To keep the quality of the products at a high level, Porevit equipped the plant with a pre-storage unit with a capacity of 10,000 tons of raw materials. After the pre-storage, the raw materials are transferred to the plant's main storage. Porevit uses two inclined conveyors that individually transports the main mix materials to six bunkers with a capacity of 240 tons each. The face mix materials are stored in 10 silos of 60 tons each. Such a solution allows the materials to be warmed up before production, which helps to continue production during the cold season. The concept developed by Masa for the dosing plant area provides a separate Masa charging scale for both the main mix and face mix silo lines. Both charging scales can in turn feed the respective aggregate belts leading to the main mix or face mix mixer allowing both mixers to be fed by any of the silos.

The combination makes the difference: the right equipment for Multi-Color products

Mixing Equipment

The mixing plant is equipped with two tried and tested Masa mixers: PH 1500/2250 for the main mix and S 350/500 for the face mix. The S 350/500 mixer allows customers to achieve very high mixture quality, which is particularly important in the production of multi-colored products. A highly wear-resistant agitator in combination with a counter-rotating mixing trough is used as a mixing tool. The mixing trough is inclined



The mixing area includes a Masa mixer S 350/500 (left) for face mix concrete and a Masa mixer PH 1500/2250 for main mix concrete

by 20° so that the mixing process is separated from the transport of the mix. This prevents cement and color balling and achieves a very good homogenization of colored concrete, even with fine aggregates and small batches. With the face mix concrete mixer, an output between approximately 120 l and 350 l can be achieved per mixing cycle.

Two separate flying bucket conveyor lines supply concrete to the main mix and face mix Multi-color blending systems. A single bucket for the main mix and triple bucket system to feed the face mix concrete helps to separate the buckets by color, which gives the additional benefit of a reduction in color contamination.

Multi-color system Premium

One of the main features of the plant is the "Premium" Masa Multi-color system, equipped with three silos for products with three different colors. Stainless steel silos with a water volume of 580 l are used. Each silo includes a flap for easy access during the cleaning process. For continual monitoring of the filling level, the silos are hung on a frame with three load cells. The colored concrete can be deposited in up to five different positions on the 1400 mm wide collecting belt. The collecting belt is equipped with a frequency converter to adjust the speed of the moving belt. This combination enables the precise placement of concrete onto the belt, and more importantly, uniform placement of the concrete into the machine silo.

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Masa Multi-color system with three silos

Masa XL 9.1

The heart of the plant is the Masa XL 9.1. By incorporating special equipment into the block making machine, the production of high quality multi-colored products can be produced more reliably. For example, the smoothing roller and laser level control system help the operator to get a uniform filling and a consistently high quality face mix texture. To better clean the upper part of the mold, the machine is equipped with a special hydraulically driven rotating brush that helps to keep the mold clean. Furthermore, the machine has a special, integrated dosing belt instead of the standard dosing flap to feed the filling box. This ensures a more even and controlled filling of the main mix-filling box and mold respectively. The machine is also equipped with the "Easy" Multi-color system, a compact version of the Masa coloring system used for the production of multi-colored wall elements with multi-colored blends going throughout the products. This device is mounted directly on the main mix machine silo of the XL 9.1.

The Masa XL 9.1 is a reliable and powerful production machine. During the production cycle, the vibration force can be adjusted independently of the speed thanks to an amplitude-controlled drive of the vibrators. To simplify and accelerate product changeovers, the machine is equipped with a fully automatic mold change. Other notable features include a solid frame construction with four hard chrome-plated guide columns (ø 120 mm) for exact parallel positioning of the mold and compaction head, forcibly synchronous mold guidance for exact demolding of the products, silo level measurement in the main mix and face mix silos with load cells, and the integration of a height limit system for producing height-sensitive products. The uniform operation and visualization of the plant components is carried out via the "Factory Automation System Tool" developed by Masa. The versatility of the Masa XL 9.1 gives customers plenty of room for creativity.



Masa concrete block making machine XL 9.1



Masa wet side
paver washing unit

Paver washing unit

To give the surface a unique texture, the operator can use the two station washing unit installed on the wet side. In combination with the Multi-color blending technology, this can give each product an individual design. Within the first sta-

tion three oscillating high pressure jet nozzle arms are moved across the surface to wash it out. The second station consists of a low pressure jet nozzle arm and a gush water tank which are moved across the surface to rinse out the remaining cement particles.

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Handling and Curing of colored products

After the surface treatment station, the fresh products are transferred into the curing area. The storage and removal process into the curing area takes place through an intelligent interaction of various Masa components such as the walking beam conveyor, elevator, finger car, intermediate finger car, and lowerator.

The curing chambers, with a total storage capacity of 5940 production boards, are equipped with the Masa ventilation system. The complete curing chamber as well as the elevator, finger car, and lowerator are installed in a coherent curing climate. The Masa ventilation system can optimize the curing process by creating a uniform climate in the entire curing chamber. It consists of horizontally arranged air-circulating fans in a separate air shaft, vertically arranged exhaust fans, and diagonally arranged humidity and temperature sensors.

The air circulation is monitored by sensors with the fans circulating and exhausting air as required. The objectives of regulating temperature and humidity in the curing chamber are to achieve a closer color uniformity across products, to create a faster curing time, and ultimately to use cement and color more effectively.

The intermediate finger car in combination with a buffer rack system, where the production boards are stored after being flipped and cleaned, gives more flexibility in production planning. This allows the wet side and dry side lines to run independently so production can continue even when one side needs to be stopped. The buffer system has a capacity for 2160 production boards. The wet and dry sides of the line can thus be operated in an individual mode and at individual speeds, and Porevit can carry out more detailed quality control in line with their strict quality standards.



Continuous operation process with Masa intermediate finger car on the dry side



Servo controlled Masa centering device with 4-sided centering clamp



Dry side, cubing area and Masa Powertainer

Looking into the future

These cutting-edge facilities cements Porevit's leading position in the regional paver market and allows the company to continue to develop in the future. Due to their very high quality and aesthetics, the pavers available under the brand name "Vibor" are already used for the design of socially significant public places in Tyumen and the surrounding area.

Soon, Porevit will again prepare for the future by equipping the sand lime brick plant with a new Masa sand lime brick press. This will enable the "Partner-Holding" to achieve both an increase in capacity and an expansion of its product portfolio. This shows once again that the business relationship between Porevit and Masa is built on a very strong foundation



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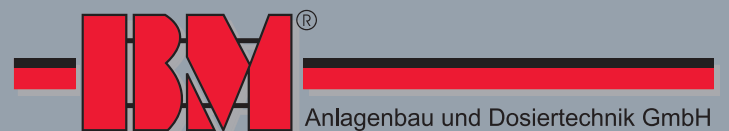


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