

Weckenmann Anlagentechnik GmbH+Co.KG, 72358 Dormettingen, Germany

Successful precast plant modernisation at DSK Blok in St. Petersburg

The LSR Group, established in 1993 in St. Petersburg, is one of the leading construction companies in the Russian Federation and is also one of the undisputed market leaders in the precast concrete element manufacturing sector. A few years ago the LSR Group began with the modernisation of its manufacturing plants in Moscow, St. Petersburg and Yekaterinburg. The last project in the context of this modernisation phase was the DSK Blok precast plant in St. Petersburg, whose production efficiency was optimised by means of different key figures such as energy consumption, environment-friendliness or annual output per employee.

The formula for success

The Blok precast concrete plant, which belongs to the LSR Group, occupies a leading position among the precast concrete element manufacturers in the northwest of Russia. The company's range of services extends from the project planning of buildings and the manufacture of the corresponding precast concrete elements to the complete construction of ready-to-occupy residential buildings. Blok's success is based on modern manufacturing technology, which enables the fast, large-scale construction of high-quality residential buildings.

In 2007 DSK Blok began to modernise its production facilities together with the German plant manufacturer Weckenmann Anlagentechnik GmbH & Co. KG. The technical conversion of the plant took place in two stages without stopping production. The objective was to modernise not only the production, but also the building technologies. The new house building system from DSK Blok is a building manufactured entirely of precast concrete elements which,

unlike the conventional sandwich construction method, consists of supporting walls with a thermal insulation composite system. Solid slabs, supporting interior walls, lift shaft elements, stairs, landings, balconies and parapet panels are also used.

DSK Blok's innovative building technologies were received extremely positively by the market, which led to a considerable increase in demand and in the volume of orders. The company management then decided to increase the output of the works, which led to the second modernisation phase. In the context of this second stage, eight modern battery moulds in various dimensions and a pallet circulation plant with shuttering robot technology were supplied by the Swabian plant and machine manufacturer Weckenmann. With this production extension the output of the works was increased to nearly 2,000 m² of wall elements and 1,000 m² of solid slabs per day. Apart from the increase in the output, the product quality and the working conditions were also considerably improved.

The new battery mould generation from Weckenmann

The special design of the Weckenmann battery moulds is characterised by the following points:

- Extremely rigid construction, which enables the individual chambers to be completely concreted in one go.
- Optimised high frequency vibrators located inside the panels in special vibrator pockets. This results in particularly intensive concrete compaction with reduced noise emission and perfect floor surfaces.
- All horizontal and vertical intermediate shuttering elements are equipped with seals for above-average clean and sharp edges to the precast concrete elements.
- Effective integrated heating, which can be heated with thermal oil or water. The heater controller controls the temperature gradient and the heating duration. Extremely small temperature differences within the chambers.



The new house building system from Blok replaces the traditional sandwich construction method by a system consisting of supporting walls and a thermal insulation composite system



Housing complexes can now be manufactured in better quality and with shorter delivery times by the use of state-of-the-art technology from Germany.



EFFICIENT PRECAST CONCRETE PLANTS BY WECKENMANN BATTERY MOULDS

Benefit from customer-specific
complete solutions of the technology leader

The vibration-optimized structure and finely tuned formwork profile systems enable a flexible and efficient production of double-sided smooth surfaces. The fast and precise concreting of the individual chambers is carried out by the integrated special concrete distributor.

Weckenmann is a system supplier for new plants and partner for the modernization of existing precast concrete plants: www.weckenmann.com



Battery moulds are ideally suited to the space-saving manufacture of wall elements which are formwork-smooth on both sides



The Twin-Z shuttering robot also impresses with its speed

- All shaping parts of the shuttering are manufactured in a narrow tolerance range in order to fulfil the strict quality requirements at all times.
- The shuttering is opened and closed by electric motors. Closing is implemented by just two hydraulic cylinders. That makes the handling fast but nevertheless very safe. Beyond that the closing pressure of the unit is continuously electronically monitored and kept constant.

Exclusively supporting exterior and interior walls are manufactured by Blok in the battery moulds, which are custom-made by Weckenmann. The maximum dimensions that can be manufactured are 7.27 m x 2.8 m. The floor shuttering elements are height adjustable so that different storey heights can be realised. Buildings are offered in the so-called 'Economy and Business Class', which differ only by 20 cm in the room height.

Ultra-modern pallet circulation technology

Solid slabs measuring up to 3,580 mm in width and 160 mm in depth are manufactured on the pallet circulation plant, which encompasses 40 formwork pallets (dimensions 3.9 m x 12 m). Compared to the first circulation plant supplied by Weckenmann in 2007, DSK Blok attached importance this time to state-of-the-art shuttering robot technology. The patented Twin-Z technology, which grips the shuttering elements directly by the integrated magnets with two synchronously operating vertical axes, convinced the project team from Blok due to the very fast cycle times at first go. The use of state-of-the-art robot technology was also possible among other things because Blok increasingly uses modern CAD software for the design of precast concrete elements. The responsible colleagues from the IT Department had concerned

themselves at an early stage with the integration of CAD and ERP software in work preparation and production. A master computer takes the pallet data from the CAD system and uses it to generate the necessary production data.

A further new item was successfully realised for the first time at DSK Blok in the form of an innovative compaction system. In addition to a conventional shaking station, which makes the pallet oscillate in a longitudinal, transverse and circular direction, a high-frequency vibrating station was also installed. So that the vibration energy is transmitted directly into the pallet without a detour, the vibrators are connected to the pallet by means of high-performance electromagnets. This almost loss-free introduction of the vibrations reduces the noise level by over 10 dB, i.e. by half. Nevertheless the energy input is very intensive and the compaction result is accordingly good.



Combined shaking/vibrating station with high-performance electromagnets



Curing chamber with hot air heating

The engineers from Weckenmann see it as their duty to continuously improve technical solutions. For instance, a synchronising controller for tilting tables and cross-lifting trucks was developed last year. Pallets running at an angle and problems when tilting, caused by unequal loading, are thus consigned to the past. With the integration of this controller a source of error in earlier plants was securely and permanently eliminated.

The curing chamber heating consists of an air circulation system fed by thermal oil, which provides for a constant temperature at the individual levels. The humidity necessary for the avoidance of cracks in the concrete surface is retained in the system. If it does rise above a certain level, however, which could lead to the condensation of the excess moisture inside the chamber, moist air can effectively escape via automatically actuated openings in the chamber ceiling, thus reducing the humidity.

The remaining plant components are taken from the Weckenmann modular system. The spiked roller, which has been in use for decades worldwide, does its job reliably in the plant, as do the pallet cleaner and oiler, the shuttering transport and cleaner as well as a power trowel.

Summary

DSK Blok has consistently pursued its policy of result-orientated works modernisation with this investment. The cooperation of the two future-oriented companies has resulted in the implementation of innovative ideas, which among other things have enabled an increase in production output, the extension of the product range, the optimisation of the product quality with regard to geometry and surface quality and the minimisation of production and maintenance costs.

17 battery moulds, each with a capacity of 20 chambers, and two circulation plants are now in operation at DSK Blok. Innovative new trails have been blazed together and Blok was able to strengthen its market presence further in the St. Petersburg region, the second largest housing market in Russia. At present the total output of all of the holding's precast plants (Moscow, St. Petersburg and Yekaterinburg) is about 1 million m² of living space per year. That is beyond any doubt an impressive performance. ■

FURTHER INFORMATION



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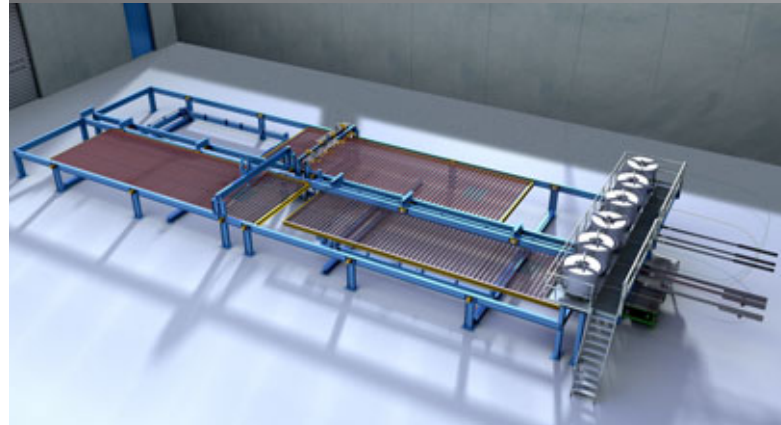


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STRONG CONNECTIONS

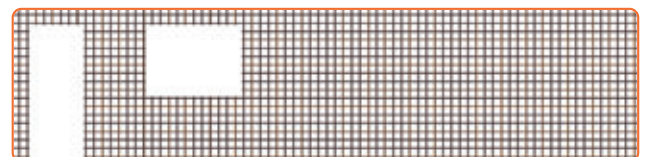
MSM-M

Mesh welding machine - Modular



Characteristics:

- Customized solution through modular plant system.
- Compact plant design requires little space (35 x 12 x 4 mtr. / L x W x H).
- Performance capacity up to 400 m² per hour. Higher productivity on demand.
- CAD based mesh welding with windows and door openings.
- Reinforcement meshes for floors and walls welded on the same machine equipment.
- No subsequent rotation required.
- Rigid construction of the pallet circulation. Low maintenance required.
- Subsequent system expansion possible.
- Extendable with bending equipment.
- Nr. of wire diameters from 3 to 6.
- Wire diameters standard from 6 - 12 and optional to 16 mm.
- Center to center 50, optional 25 mm.
- Shortest bar 400, optional 200 mm.
- Shortest spacing 100, optional 50mm.
- Base execution with 2 welding heads, extendable to 4.



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