

Prinzing Pfeiffer GmbH, 89143 Blaubeuren, Germany

Minskmetrostroy expands its business model to include sewer and wastewater systems

The core business of Minskmetrostroy can already be found in the name of the company: The precast concrete manufacturer is responsible for the construction of the underground railway in Minsk. Now that the underground railway tunnels are largely completed, the company has decided to expand its competencies and enter new business fields. Minskmetrostroy has invested in a modernisation of current production and in the expansions of the plant and is now also dedicating itself to infrastructure construction. Prinzing Pfeiffer provided suitable solutions for the necessary upgrading of the plant.

True to the motto "You have to think into the future", Minskmetrostroy decided not to focus only on products used exclusively in the construction of underground railway shafts. The aim was to additionally dedicate itself to underground and infrastructure construction and to supply products for sewer and wastewater systems for urban and road construction. A reliable partner was sought for this innovative project. Since Prinzing Pfeiffer, a member of the Topwerk Group, has successfully built and modernised various plants in Belarus for over the past 20 years, the company was immediately short-listed. The tailor-made solutions as well as the quality and performance of the machinery finally convinced them. In 2020, Prinzing Pfeiffer supplied equipment for the modernisation

of the existing production as well as a new high-performance machine for the production of concrete pipes and a machine for the production of concrete manholes. The production of pipes and manholes has already been running at full speed since the end of 2020.

Minskmetrostroy currently employs 330 people. The plant has a total production area of approx. 12,000 m² and currently produces more than 17,000 m³ of precast concrete elements and 45,000 m³ of ready-mix concrete per year.

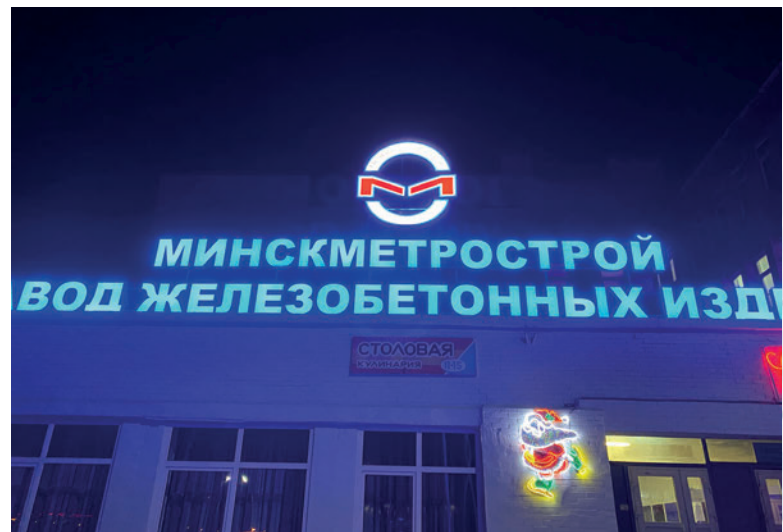
Minskmetrostroy produces quality pipes and manholes with very high strength, watertight and dimensional accuracy. In order to create an ideal foundation for this quality, they started with the improvement of concrete quality and concrete logistics. Prinzing Pfeiffer not only supplied two new machines, but started at the cradle: the dosing and mixing technology. The mixing tower was refitted, a bucket conveyor was built to transport the concrete and a modern concrete distribution system was set up.

Mixing tower equipment

If you look at the modernisation of the Minsk plant in its entirety, you start at the mixing tower. The aim was to be able



Concrete pipe production with the Radial Press at the Minskmetrostroy concrete plant



The "Minskmetrostroy" concrete plant is a leading supplier of concrete and reinforced concrete products for underground railway and tunnel construction.



The new SX-series planetary mixers are used to produce concrete mixes for drycast and wetcast processes.

to produce both drycast and wetcast concrete. That is why the heart of the tower now consists of three new concrete mixers from the SX series, which can be used to produce both earth-moist concrete and more fluid types of concrete. Two large 2250-litre concrete mixers produce both ready-mixed concrete and concrete for use in the company's own plant for the production of tunnel segments, pipes and manholes. The third 1500-litre concrete mixer is specially designed for bentonite, which is needed for tunnel drilling. All three concrete mixers run in parallel, so there is no loss of productivity and they can thus produce up to three types of concrete simultaneously. This is also controlled in the mixing tower, because this is where the central control system is located. The plant operator has everything in view: the control system includes the three mixers and two bucket conveyors at the same time.



Large maintenance flaps make the mixer easily accessible.

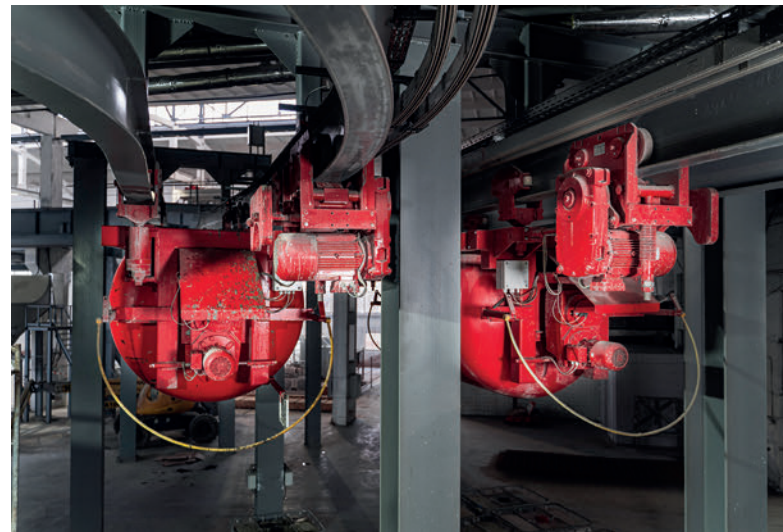
Ready mix concrete for construction sites is loaded from one of the mixers. From the second mixer, the concrete is transported to the production facilities via two parallel bucket conveyors. One bucket conveyor leads into the hall to the two new machines, the other to the production of Minskmetrostroy's tunnel segments. The third mixer is used for the production of special bentonite mixtures.

New concrete distribution system

Once the concrete has reached the halls via the bucket conveyors, it continues to the concrete distribution system. Previously, a concrete silo was filled and the material was brought to the individual moulds via cranes. These were filled via a crane bucket. Now the required amount of concrete is pro-



The control centre of the concrete mixing and transport plant



The bucket conveyors ensure accurate and continuous concrete transport to all machines and moulds in the plant.



The new concrete distribution system for the tunnel formworks

duced by the mixer, transported to the concrete distributor with the help of the bucket and automatically filled into the moulds via the concrete distributor. This saves staff and time. In addition, the mould is filled in a controlled manner, which is not only efficient but also benefits the quality of the end product.

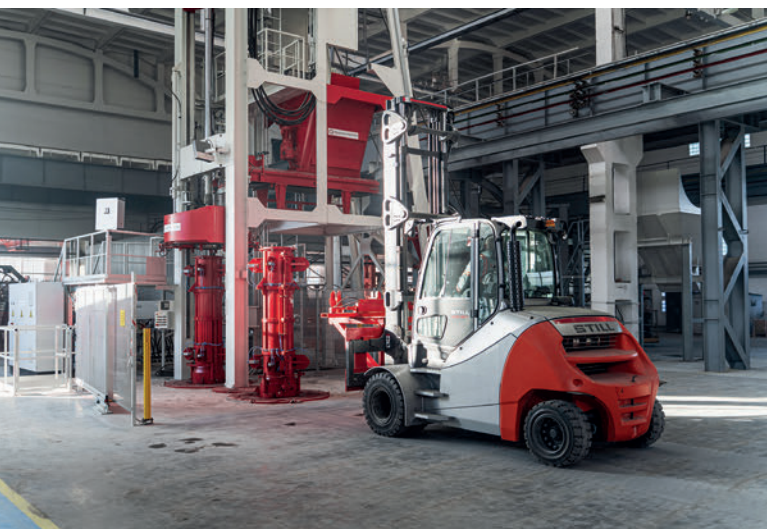
The fully automatic Radial Press

The bucket cars lead us to the new RP 1230-4 Radial Press. The fully automatic high-performance machine produces non-reinforced-, steel-reinforced- and plastic-fibre-reinforced pipes and therefore offers exactly the flexibility that Minsk-metrostroy is aiming for. The high drive power also enables the production of both extremely thin-walled and double-reinforced pipes for pipe jacking.



Finished precast concrete elements for tunnel construction

The Radial Press is a machine that achieves a very high production output with low manpower. It automatically controls the state of compaction of the product. Only when it is completely compacted is the production process terminated. In the radial pressing method, the concrete mass is added to the mould in a controlled manner, while compaction is constantly monitored by state-of-the-art sensor technology. When the actual compaction reaches the target, the roller-head starts rising again, automatically calculating the rising speed. The cycle time is currently between 75 and 230 seconds, depending on the pipe length and diameter. Minsk-metrostroy currently uses the Radial Press to produce mainly sewage pipes with nominal diameters of 300 mm to 1,200 mm and a length of 2.50 and 3.00 metres.



The Radial Press type RP 1230-4 with fork-lift truck off-bearing



The freshly produced concrete pipes

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Further handling was chosen accordingly with a view to on-site production: The product is picked up by a fork-lift truck with mould opening equipment to a curing area where it hardens before being tipped out. A second fork-lift truck with a pipe transport clamp is used to place it on the removal truck. The mould change on the Radial Press takes place within an hour and production starts up again immediately.

Flexible Atlas production system

In addition to sewage systems, infrastructure construction also includes manhole systems, which is why Minskmetrostroy opted for a second machine, the Atlas from Prinzing Pfeiffer. If you turn to the other side of the production hall, you can see the lifting beam with integrated press floating through the building. With the Atlas, Minskmetrostroy fulfils its goal of having a versatile machine that can produce many different products. Accordingly, the mould change should

also take place in a very short time. The Atlas meets all these requirements and is universally suitable for manhole rings, bases and cover slabs of all kinds. It is semi-automatic and is operated by a machine operator and a crane operator.

The mould is clamped hydraulically on the high-performance vibrating table, then the mould is filled and finally the concrete distributor with wiper ring removes the excess concrete from the mould. The result is therefore a precisely filled mould without material loss. When observing the machine, it is also noticeable that it not only performs a vertical but also an oscillating rotary movement - it rubs and trowels while being vibrated from below. This also contributes to the very good quality of the end product. The cycle times of the machine depend on the nominal diameters and the product length and currently range between two and four minutes at Minskmetrostroy.



The rollerhead is the compaction tool of the Radial Press / The rollerhead change



Mobile press/lifting beam of the Atlas 150/150



Atlas 150/150 - Manhole cover slab production

RADIAL PRESS RP *for* *high performance* **PIPE** *production*



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**PRECISE
DIMENSIONS**

**FAST MOULD
CHANGES**



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Leading with proven technology.



Minskmetrostroy employees are pleased with their training certificates and can operate the machine independently.



The General Director of Minskmetrostroy, Mr. Stuhalsky (right) and Regional Sales Director of Prinzing Pfeiffer GmbH, Alexander Probst are looking forward to the new joint projects.

Delivery, commissioning and training

Like so much in Corona times, the 2020 delivery and commissioning were associated with challenges. But as soon as it was possible to leave Germany again, fitters and an electrician travelled to Minsk and were able to carry out the installation and commissioning quickly. Minskmetrostroy had carried out perfect necessary preparations for this and created all the conditions on the customer side for a quick implementation of the project: The hall was cleared out, new foundations completed, the power and compressed air lines redrawn, cranes renewed and both supports and rails built for the new bucket conveyor. Prinzing Pfeiffer organised remote support due to the pandemic and arrived in Minsk in the summer. Right from the start, the future machine operators took part

in the installation and commissioning and were then trained as operators and certified for the operation of the new machines.

The General Director of Minskmetrostroy, Mr. Stuhalsky, was pleased with the quick implementation of the large project: "We are still in close contact with the contact persons at Prinzing Pfeiffer and are enthusiastic about the holistic solution, which opens up new possibilities for us. Despite the Corona-related challenges, the teamwork was excellent, so that we were already able to start production last year. For such a large project, you need a reliable partner who can adapt flexible to our conditions on site and we have clearly found this in Prinzing Pfeiffer. We are excited to see how the new business area of infrastructure develops for us and are sure that this investment was the right decision."



View of the current production at Minskmetrostroy / "METROZAVOD"

One of the most modern plants for infrastructure products

The Minskmetrostroy project meant an expansion and at the same time a profound modernisation. With Prinzing Pfeiffer, part of the internationally operating Topwerk Group which include other renowned companies such as Hess Group, SR Schindler and Hess AAC Systems, Minskmetrostroy has found what it considers the ideal partner for this. In the course of the expansion, the company has advanced to become one of the most modern plants for infrastructure products in Belarus. It was already well positioned internationally and managed to gain a foothold in the infrastructure market in just a few months. Minskmetrostroy already supplies several projects in urban and road construction nationally and internationally. The product launches are going very well, so that the company is already considering an expansion of the product range, because the prerequisites for this are provided by the new Radial Press and the versatile Atlas. ■

FURTHER INFORMATION



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