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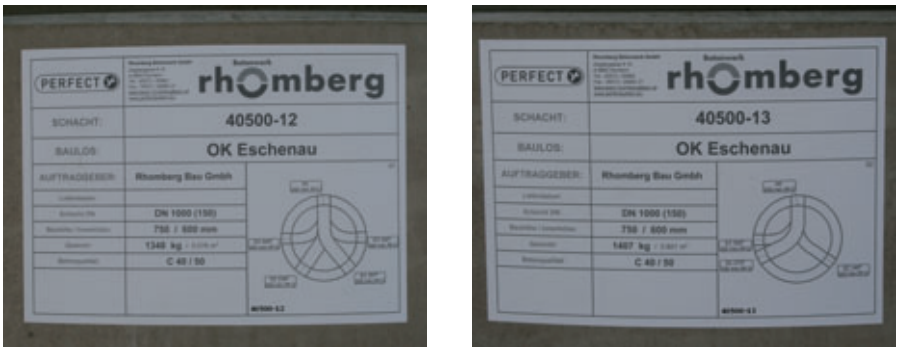
Efficient one-man manufacturing for perfectly fitting concrete manhole subcomponents: The Rhomberg concrete plant relies on the use of EPS moulded parts for visible product quality.

Over the past few years, pre-assembled component manufacturers have had to make decisions of strategic significance to further the development of their companies. Most notably is the introduction of custom-made manhole bases for civil engineering in most European countries. Such is the case at the Rhomberg concrete plant, a family enterprise founded in 1964 in Dornbirn in Vorarlberg, Austria. The company specializes in manufacturing manhole components and has, for decades, very successfully supplied their domestic market, renowned for its high quality benchmarks. In addition to the strict concrete quality requirements, in general, and the high surface quality, in particular, it is predominantly the agricultural and infrastructure-related features in Vorarlberg that poses ever new challenges for the manufacturing of pre-assembled components.

Numerous projects are accomplished with custom-made manhole subcomponents approximately two months after commissioning the Perfect manufacturing system.



Diverse channel configurations are required for the extension of local sewers in Eschenau in Dornbirn.

The development of settlements in the foothills of Arlberg and the Bregenzer Wald means that different gradients, sometimes as extreme as 40%, must be implemented in the piping and manhole structures. Furthermore, the lack of space in the Rhine Valley for construction of all types demands special requirements for the connections of discharge pipes to the main sewers. As a result, this region has more connections to a single manhole than can be observed in the rest of Europe. And, in addition to these extreme values, the channels must also be precisely executed with very low gradients for installation in the flat Rhine valley.

For Mr. Bernhard Rhomberg, these requirements meant that a future-oriented manufacturing technology for his company would need to possess a high degree of flexibility in terms of the channel configurations being produced. Also, when working on existing structures in particular, the market demands great precision of manhole configurations with regards to the disparity in channel connections and gradients and

Visible product quality – the pre-assembled components manufactured with ready-mixed concrete from the Rhomberg concrete plant are convincing due to their flawless surface.

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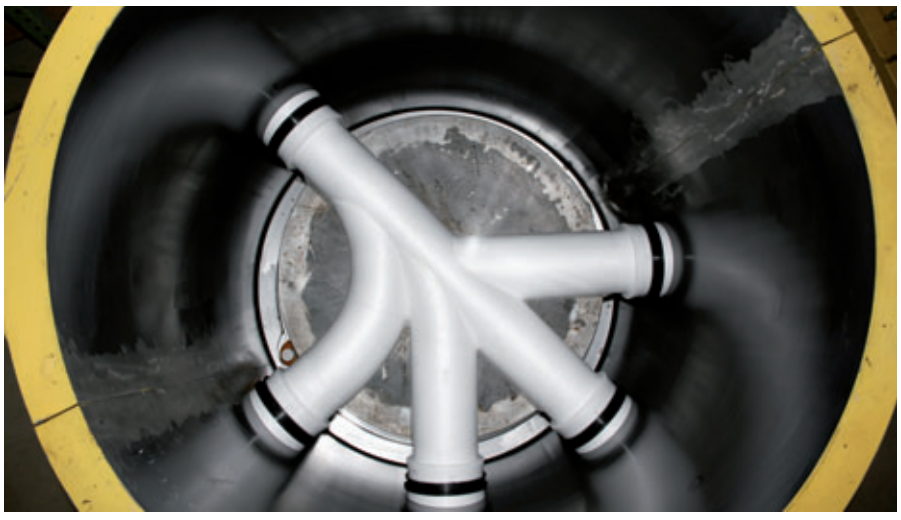
In total, 16 moulds are available for filling with self-compacting concrete in the start phase at the Rhomberg concrete plant.

A multitude of pipe connections is characteristic of channel construction in Vorarlberg, as is seen in this component for the local sewer system in Dornbirn.



Several intakes are also combined in manhole bases < DN1000. – This picture shows a prepared mould for a DN 800 manhole subcomponent.

pipe connections. Furthermore, the quality requirements for new construction projects continue to remain high. "Both in public channel construction and in private domestic connections, customers have now realized that higher quality quickly pays off by producing a manhole in a single-step process, for example," said Mr. Rhomberg. "Meanwhile, private structures also need to be produced, for which the usual leak tests exist for the municipal sector."

With Schlüsselbauer's Perfect manufacturing system, every quality requirement can be reliably fulfilled at the Rhomberg concrete plant, regardless of whether a pipe gradient needs to be executed at 40% or 1.5 %, or whether a diverging slanting position needs to be precisely executed in the pipe connection. In order to minimize the component weight of most common pipe connection types and diameters, Rhomberg offers DN1000 manhole subcomponents in four wall thicknesses:120, 150, 190 and 230 mm. As a result, not only is concrete consumption optimized, but customer transportation costs are also subsequently reduced. Due to the very diverse and mostly complex structures, the feasibility study for components is very important for the manufacturer during customer consultation in the tendering phase. An assertion can be reliably made on whether a component can be manufactured in compliance with the necessary minimum dimensions with only few entries into the planning software.

A further specialty at the Rhomberg concrete plant is making concrete manhole subcomponents in nominal widths, DN800 and DN625, which are typically used as domestic connection manholes. In exceptional cases, in particular for work on existing structures in heavily built-up areas, DN800 components can also be used for municipal wastewater discharge. Accordingly, for these smaller manhole diameters, several intakes must be made in each component, wherein a total construction height of up to 850 mm is common. Therefore, it was also crucial for Rhomberg to be able to manufacture smaller nominal width components in accordance with the same manufacturing principles. Manhole subcomponents in the nominal widths DN1200 and DN1500 complete Rhomberg's range.

The traditionally high quality requirements in Vorarlberg were especially crucial for the Rhomberg family in the decision-making process of purchasing the Perfect manufacturing system. In addition to the planning freedom of manufacturing individual channels, the use of self-compacting concrete

Operatiing the Perfect manufacturing system using EPS moulded parts is uncomplicated and ergonomically optimized.

Operator guidance is provided via comprehensible displays on the individual workstations.

with an accordingly homogeneous concrete surface on the component was also convincing. However, due to the plant's already installed mixing system using earth-moist concrete to produce manhole rings and cones, the Rhomberg family was presented with another challenge on whether it would be better to install an additional mixing system or use alternative concrete supply methods.

The Rhomberg family opted for purchasing ready-mixed concrete and now has enough C40/50 class concrete to fill 16 manhole subcomponent moulds delivered on an as-needed basis from a nearby ready-mixed concrete plant. The concreting process is completed in approximately one hour using concrete tubs, and additional work, such as the daily switchover of the mixer from earth-moist concrete to self-compacting concrete, in the case of multiple uses, and ongoing mixer cleaning and maintenance, is no longer necessary.

The fact that a single worker can accomplish the entire manhole subcomponent production process from the demoulding of the previous day's production through to the production of EPS channels and the pouring of concrete in the moulds makes the installed Perfect manhole base machine at the Rhomberg plant a very efficient solution.

Additional product specifications, including firmly integrated seals in the concrete, spherical head anchors that are optionally cast into the manhole subcomponent wall or installation surface and the clear identification of products with labeling in DIN A4 format, ensure that Perfect manhole subcomponents are met with widespread acceptance among Rhomberg's customers right from the start.

The investment decision of the owner and Managing Director, Mr. Bernhard Rhomberg, was proven after a matter of months. "After critically weighing up several alternatives," Rhomberg said, "we opted for using a manufacturing process using EPS moulded parts for channel production. This decision proved to be the right one for us just after a short time."

Firmly integrated seals into the concrete ensure tight connections of all common types of pipe.

Regardless of the wall thicknesses of the manhole subcomponent, transport anchors are laterally encased into the wall or in the contact area for manhole rings.

FURTHER INFORMATION

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