

Schlüsselbauer Technology GmbH & Co KG, 4673 Gaspoltshofen, Austria

# Monolithic Concrete Manhole Base Production in Slovakia

The company Zábajník s.r.o., based in the Czech town of Veselí nad Moravou, is specialised in the production of concrete elements for civil engineering and is one of the leading producers in this branch. The product range comprises of the whole manhole program consisting of manhole rings, cones and bases. In the mid 1990's and in order to meet with the high quality requirements of the Czech market the general manager, Mr Jaroslav Zábajník, attempted to cooperate with an Italian partner in the production of monolithic manhole bases. However, serial production was not possible due to a lack of productivity and the high pricing pressure. Therefore Zábajník s.r.o. decided to return to the conventional method of manual manhole base production. In 2008, still with their goal in sight, the company decided to approach the Austrian company Schlüsselbauer Technology GmbH & Co KG located in the town of Gaspoltshofen and decided to invest in a Perfect production plant for the production of monolithic manhole bases. The new Perfect plant finally went into production at the end of March this year at a specially chosen new production site in Slovakia.

■ Mark Küppers, CPI worldwide, Germany ■

The origins of Zábajník s.r.o. go back to the middle of the 20th century when it was a state owned company which also produced concrete elements for the civil engineering and road works branches. After the political split of Czechoslovakia into the Czech Republic and Slovakia at the beginning of 1993 Mr. Jaroslav Zábajník decided to privatise the company and has been running the company together with about 25 employees in the town of Veselí nad Moravou. The company Zábajník s.r.o. supplies an area within a radius of about 200 km with its manhole program from its main factory in the Czech Republic. The customers are almost equally divided into public building developers, investors and the industrial building contractors.

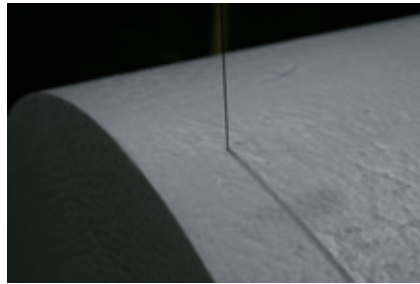
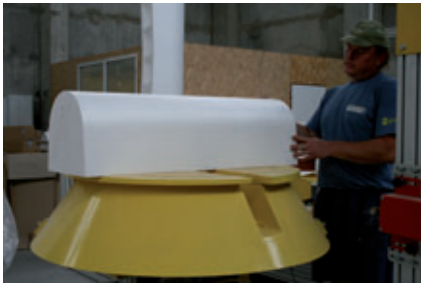
Over the years the Czech market has developed dynamically and the concrete elements used in the civil engineering and road works sectors now have to meet with very high quality standards according to legal specifications. Because of this it was necessary to change from the relatively easy mass production method to quality products with the corresponding higher prices. As it gets more and more difficult to meet the requirements of tenders by use of the manual lining and channel forming method, Zábajník s.r.o. has gained a big advantage over the Czech Republic and Slovakian market with the commissioning of the Perfect production plant for monolithic manhole bases. In the small town of Vel'ke Ul'any, close to the Slovakian boarder and about half an hour by car from the capital Bratislava, a new production location has been found and the Perfect plant has been erected in an old production building, which the owners decided to purchase.



*Zábajník s.r.o.'s new factory in Slovakia*



*Manhole bases are produced in the new factory. The other products are produced in the Czech Republic and delivered to Slovakia.*



*The EPS pieces are cut to size with various hot wire cutting saws and then stuck together with hot glue.*

The complete concrete mixer has been assembled right in front of the production building. Apart from the Simem – mixer everything was delivered by a Czech company. Self compacting concrete (SCC) is produced for the Perfect production. Zábajník s.r.o. has worked closely together with the University of Brunn and the specialists from MC Betonchemie to achieve an optimal result regarding production with heavy duty concrete. The extra ingredients are extracted from a nearby gravel pit. Three funnels each store 60 tonnes of sand, fine and rough gravel. A fourth funnel is

present but not in use at the moment. The filling of the funnels together with the filling level controlling process are carried out fully automatically. A silo with two chambers is filled with a maximum of 60 tonnes of cement and gravel whereby an average of 30 tonnes of concrete for the concrete manhole base production is mixed per day.

#### **Industrial production system for individual monolithic concrete manhole bases**

The Perfect production system is designed for the production of monolithic concrete

manhole bases with nominal dimensions of 800 to 1.500 mm and a channel diameter of 150 to 1.000 mm. At the moment Zábajník s.r.o. only produces manhole bases with diameters of 1.000 mm. 20 moulds of this size are available. In the long term the product spectrum is expected to be extended and include the dimensions 800, 1.200 and 1.500 mm. Five moulds are already available for the 1.500 mm manhole bases. They are not yet used in the daily production.

Only 3 people are involved in the whole production process – the factory manager



*Steel insertions for standard straight channels*



*The touch screen provides the operator with all information.*



*An overview of the Perfect production.*



*A bucket car transports the concrete at Zábajník s.r.o. from the outside area into the production building.*



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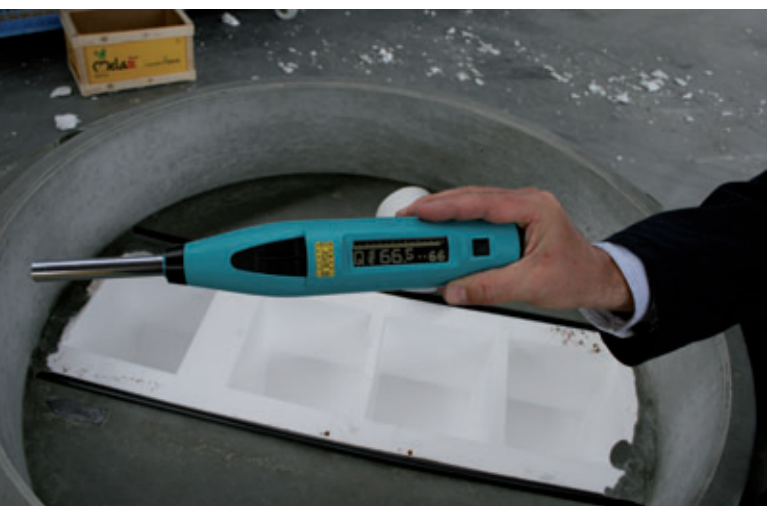
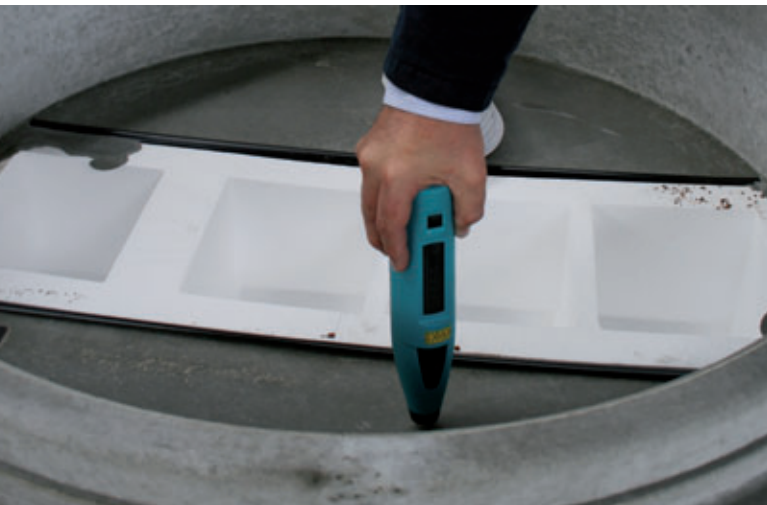


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The manhole bases are grabbed with the special turning grabber and turned 180°

and two employees. While the factory manager deals with the concrete technological and commercial issues the two other employees are the only ones actually involved in the production process of the concrete manhole bases. Zábojník s.r.o. produces in a single shift however if necessary more shifts can be introduced.



Firmness test with the SilverSchmidt from Proceq

### Negative moulds made from polystyrene (EPS)

The Perfect system stands out due to its large range of individuality. All channel and pipe connection inclinations as well as the amount of connections can be defined individually. Therefore the concrete manhole bases can meet with the individual requirements of various projects. It is possible to connect various types of pipes to the manhole bases.

The Perfect production system is a combination of high quality mould equipment and a modern hot wire cutting technique for accurately fitting mould parts. Before actually beginning with production the manhole base is first constructed visually on a P.C. All parameters such as the amount of connections, inclinations, pipe connections, diameters of the in and outlets are entered into the system. All of this data is then printed onto a large label which then accompanies the whole production process. The labels also provide further information such as customer name, delivery location and information about the concrete.

The first step of the actual production of a Perfect manhole base is to take the information gathered and produce a recess unit out of polystyrene (EPS). This mould is then later used to form the channels in the manhole base. Single EPS pieces are cut by means of the hot wire saw and then stuck together with hot glue. As an option the moulds can then be complemented with either a cavity unit or an integrated gasket. The only job the operator has to do is to fix the EPS part onto the specified position of the cutting unit. The actual cut is programmed and carried out automatically. With the three dimensional cut-off saw it is possible to optimise the channel progression hydraulically. Via touch screen the operator receives important information for his work. The finished recess units are then mounted into the moulds.

### Concrete in one Pour

Concreting in one pour with SCC guarantees that during reproduction the concrete quality remains the same throughout the whole product. The concrete at Zábojník s.r.o. is driven from outside into the production building by a bucket car from the Italian company Boscaro. An overhead crane carries the bucket over the individual moulds which are then filled manually with concrete. No further work is necessary. Production is carried out upside down (i.e. turned over by 180°) which means that the manhole base is concreted into the manhole base bottom.

### Mould removal and transport

The next day the moulds are opened. The side fixed mould is made up of two halves and is pulled away on rails from the concrete piece. By use of a special turning grabber the manhole base is grabbed and turned by 180° and placed in the intermediate storage space. The EPS pieces are manually removed here and the label is stuck on the side of the product. Then the manhole bases are transported with a forklift to the outside storage area before they are delivered to the customer. Having been removed the EPS pieces are crushed in a shredder, placed in large sacks and sold to two customers in the Czech Republic and Slovakia who use the EPS granules in their concrete production.

### Much Customer Interest

The company Zábojník s.r.o. has to date presented its monolithic manholes at two trade fairs in Brunn and Bratislava and received a very positive response from the trade fair visitors. Potential customers were especially pleased with the clearly visible surface quality of the monolithic concrete manhole bases.





Removal of the recess units



The removed EPS pieces are crushed in a shredding machine from Heger GmbH



A finished concrete manhole element with an integrated gasket from DS-Dichtungstechnik and product label

Due to the huge demand and the large amount of Perfect manhole bases which have already been delivered Mr. Jaroslav Zábojník is convinced that his investment was a success and would like to start producing further dimensions as soon as possible. Recently the company received a contract for 350 concrete manhole bases for one individual large project. ■

## FURTHER INFORMATION

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