

Schlüsselbauer Technology, Gaspoltshofen, Austria

Market Success Drives Capacity Expansion and Automation

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It was just three years ago that the owners of pipe manufacturer Bilcon Industries, based in Singapore, made a decision to introduce new pipe technology. Following the construction of a test line, the company swiftly made a start on in-house production of the concrete-HDPE Perfect Pipe (the initial report can be read in BWI 2/2016). Ever since, the corrosion-resistant concrete pipe with its easy-to-install connector, conceived by system developers Schlüsselbauer Technology, has been produced at the Singapore site and successfully deployed in dozens of pipe jacking operations. After just two years of market development, rapid growth in demand has prompted this highly reputable manufacturer to bring into service an automated production line with higher capacity, at a new site.

After a relatively short market introduction and trial phase, the Bilcon Perfect Pipe now represents the state of the art in the corrosion-resistant jacking pipe sector in Singapore and Malaysia. The corrosion resistant liner of this innovative and resilient pipe is firmly embedded in its concrete structure, and has won the admiration of customers and contractors in equal measure in the field of pipeline construction. For pipe jacking in particular, the quality demanded of the pipes has increased substantially in recent years. Contractors are required to demonstrate through repeated inspections that the pipes are

free of damage and deformation after installation and remain so for a specified service life thereafter, ensuring they are suitable for long-term use. If not – that is, if damage does arise – the companies responsible for installation are obliged to replace them, which could threaten the contractors' very existence, whether the pipes were laid in trenches or by pipe jacking.

In Singapore, therefore, there was a demand that all pipes to be used in infrastructure projects should not only have long-lasting corrosion protection to ensure a long service life, but could be laid at the building site in such a way that they would not suffer damage during the construction phase itself. This requirement to prevent pipe damage during installation is of particular importance in pipes with nominal diameters in the no-man entry diameter spectrum, since compared with pipes of accessible diameter, repairs to such pipes are significantly more expensive, if not totally impossible and requiring complete replacement.

The new Bilcon Industries pipe precisely met the expectations of the responsible planners, public and private-sector customers and – by their own account – construction firms carrying out such work. On the basis of positive experience with the Bilcon Perfect Pipe, it is anticipated that larger pipes, too,



Perfect Jacking Pipe in the Bilcon Industries outdoor storage area



The welded liner cylinder will be transported with an auxiliary structure and the crane to the reshaping station.



Here, both ends of the liner will be formed in a thermoplastic process according to subsequent pipe joint.

will increasingly be installed with the same continuous anti-corrosion system in Singapore and Malaysia, and that concrete pipes with an HDPE lining will be included in the technical specification of projects even more frequently than ceramic or flexible pipes. The concrete pipe system with

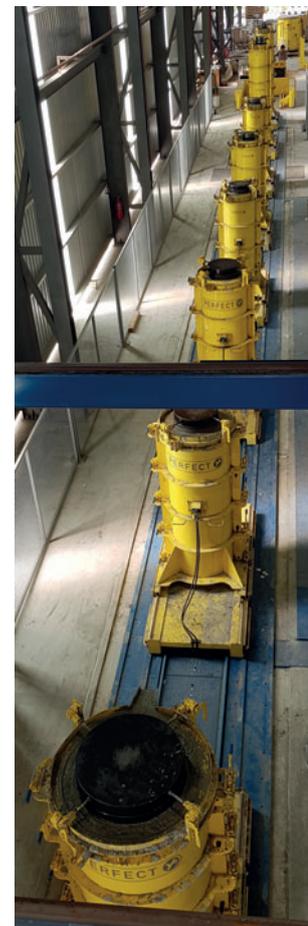
Perfect Liner corrosion protection and synthetic push-in connector -also known as Perfect Connector - is available from Schlüsselbauer Technology in a range of nominal diameters from DN 250 to DN 1200.



Fully prepared moulds with Perfect liner and reinforcement cage



Filling the prepared moulds with self-compacting concrete



The filled formwork is on the way to the hardening station



Hardened Perfect Jacking Pipe



After hardening in the mould, the jacking pipes get demoulded.

Bilcon Industries Sets New Standards with Concrete-HDPE Composite Pipe

The DN 300 Perfect Pipe - it was with this small diameter pipe, fiercely fought over in the competitive pipe materials market, that the success story of in-house production at Bilcon Indus-

tries first started. Since then, pipes of DN 300, DN 400, DN 500, DN 600, DN 700, DN 800 and DN 900 diameter - primarily for pipe jacking projects - have also gone into production. All dimensions are part of a comprehensive automated production system: cylinders are welded automatically from lengths of HDPE, their ends are shaped automatically using thermoplastic technology. The prepared moulds are then filled automatically with self-compacting concrete (SCC) and later, once hardened, the pipes are automatically demoulded. In Perfect Pipe manufacturing, workers are responsible for manual handling, cleaning and fitting processes, as well as monitoring each of the individual process stages. In order to meet only the very high quality standards both in the product itself and also in its documentation, before leaving the production facility a label is attached to each pipe, providing details of relevant product data including quality control.



The product is transported into the setting area by electric cart.

Bilcon Industries places high value on innovative concrete engineering. It is no wonder, then, that during the first two years of Perfect Pipe production, the concrete formulas and processes were subjected to continual optimization, with the result that the moulds can now be set up as standard for re-use several times in a day. The automated production plant supplied by Schlüsselbauer Technology pays particular attention to this so that, using the concept of mould-hardened production, a level of productivity has now been achieved that would scarcely have been imaginable just a few years ago. That is the view of Bilcon Industries' second generation managing director, Mr. Stephen Tan Eng Hoe, who says: "The Perfect Pipe production system is an ideal combination of the high-quality requirements at a product level and our specifications in terms of product quantities and easy operability by our staff."



At Bilcon Industries Perfect Jacking pipes are manufactured up to a nominal width of DN 900.

It is not only in Southeast Asia that the introduction of Perfect Pipe has been a striking success. In North America and Europe, too, this durable waste water pipe is prized for its installation advantages. Perfect Pipe is already in use in countless infrastructure installations in Germany, France, Switzerland, the USA and Canada. The Perfect Liner, firmly embedded in the mould-hardened concrete, has impressed engineers around the world. The benefits of using self-compacting concrete, however, are also employed to meet country- and customer-specific requirements in the design of the pipes.

The outer contour of the pipes can be adjusted according to requirements so that they can be used either as prebed pipes, circular pipes with bell-shaped joints, partially reinforced pipes or indeed as jacking pipes. This variability is made possible by the use of moulds in which the external geometry of the pipe can be altered, for example, simply by changing the mould casing to a different shape. At Schlüsselbauer Technology, this flexible style of wet cast production, known as Perfect Forming Technology, is being continually developed and improved.

Aside from the variety of possible shapes, the ability to automate production plant one step at a time represents an important aspect of the Perfect Forming Technology concept. This concept contributes to the continuous expansion of Schlüsselbauer's market leadership in the field of automated concrete pipe and manhole production. ■



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