

Long-Term Stability in Wastewater Infrastructure Thanks to Precast Concrete Parts

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In recent decades, few market segments involving the manufacture of precast concrete parts have been so heavily influenced by competing materials than the concrete pipe sector. Classic concrete and reinforced concrete pipes, as well as concrete shafts, are increasingly being forced out, primarily due to an influx of new materials in this traditionally concrete-dominated market. Aspects such as the use of locally available resources have faded into the background, as have the sometimes questionable overall properties of flexible components, with regard to their physical limitations. Restructuring of the concrete pipe industry has continued apace in many countries, largely accompanied by the accumulation of production capacity; in many cases, market players with substandard product quality have also been forced to quit the market. However, this consolidation of markets has led more to price competition on a company level than to quality competition on a product level. All in all, then, conditions would tend not to support the growth of the industry, and seem to favor suppliers of competing products.

In 2004, Schlüsselbauer Technology gave visitors to the world's leading construction trade fair, Bauma, their first glimpse of individually produced concrete manhole bases. These mould-hardened pre-fabricated parts, produced in one pour, not only met the requirement to replace physically strenuous work in precast plants with an intelligent production technique, they also represented the creation of a new

quality standard for this component application. Monolithic concrete shafts have a level of quality and durability that cannot be matched; either by concrete channels that are manually shaped in a second working step, or by traditional manually produced channels and berm surfaces made from brick or vitrified clay parts. This is, of course, provided that the quality of the concrete used is also in line with the state-of-the-art of concrete technology and the processing of self-compacting concrete (SCC). Sharp increases in the use of SCC have been observed worldwide since the initial launch of Perfect and, thanks to the market success of the Perfect production system alone, more than two million tonnes of SCC have been processed in precast concrete part production.

From the innovation step through to mould-hardened manhole base production, this process formed the basis for a range of innovations at Schlüsselbauer Technology. Under the collective term "Perfect Forming Technology", experiences from SCC processing were used on a step-by-step basis for the production of further precast concrete products. Just a few years later, in 2010, and once again at Bauma in Munich, Schlüsselbauer Technology launched a mould-hardened concrete pipe with a dependable HDPE corrosion-resistant lining for the first time. And now, just a few years on, manufacturers in North America, Asia and Europe are having great success in winning back market share in the area of wastewater drainage with their pipe supplies, which had long been seen as lost to other raw materials.



The versatility of Perfect Forming Technology for component production speaks for itself: whether circular, oval or rectangular, just one production process is required to produce a variety of solutions, irrespective of the complexity of the component.



**Gain market share
with corrosion-protected
concrete wastewater pipe**



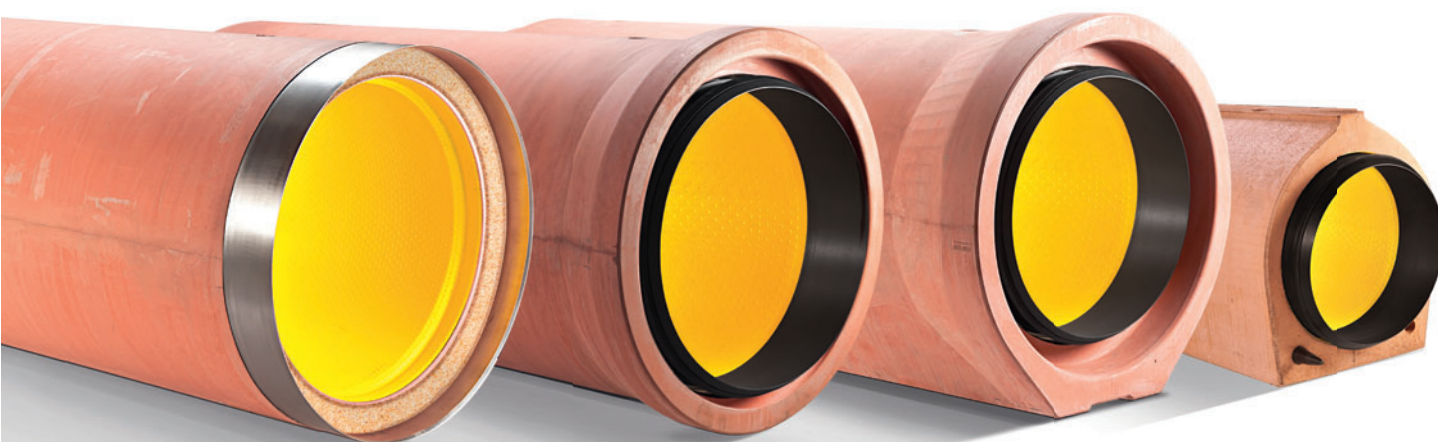
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Whoever wants to be a leader in the waste water infrastructure market must rely on a technology that offers clear technical and economic advantages compared to clay, steel and various plastic pipes. Therefore, rely on **PERFECT Forming Technology** to produce durable concrete sewage pipes with HDPE liners. PERFECT Pipe is installed in Asia, Europe and North America. Manufacturers worldwide successfully manufacture pipes and manhole components with SCHLÜSSELBAUER equipment.

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It's as easy to optimize the overall capacity and investment-related production cost as it is to adjust the number of casting moulds. If necessary, this can even be achieved at lower cost than a production process with immediate demoulding.

Optimized Value Creation Thanks to Demand-Driven Production

The overall product quality and, above all, the reliable and durable lining in the case of corrosion-resistant components only represent one of the success factors in the production of mould-hardened components using Perfect Forming Technology. Given the current trend for minimizing capital commitment through excess stock levels across a long period of time, and the accompanying increased requirements for demand-driven production, the short-term and flexible planning of subsequent production batches is becoming a key element in achieving a shorter value-creation cycle. The time span between the original value creation moment—i.e. production—and the time at which value creation is realized in terms of marketing must be reduced. In traditional concrete plants—aside from the achievable product quality—increased costs due to multiple refits of production facilities represent a challenge.

Another, oft-neglected cost factor is the non-usage of a large proportion of production facilities, such as in nominal width-based concrete pipe production. Efforts to balance out this disadvantage of traditional concrete pipe production using a nominal width mix of dry cast moulds with two or more dimensions are, in practice, always subject to a loss in quality on a product level, and also do not permit the implementation of de facto demand-driven production. Continuous mould-hardened production behaves rather differently; here, the average delivery quantity is also produced according to demand, and demand peaks can be taken into account by adjusting the number of moulds and production cycles in the short term. Schlüsselbauer's Perfect Forming Technology production concept enables both the production of custom-made components, like individual manhole bases, and the production of highly standardized components like shaft superstructures or pipes in the same production program; here, the overall production capacity can even exceed that of a con-



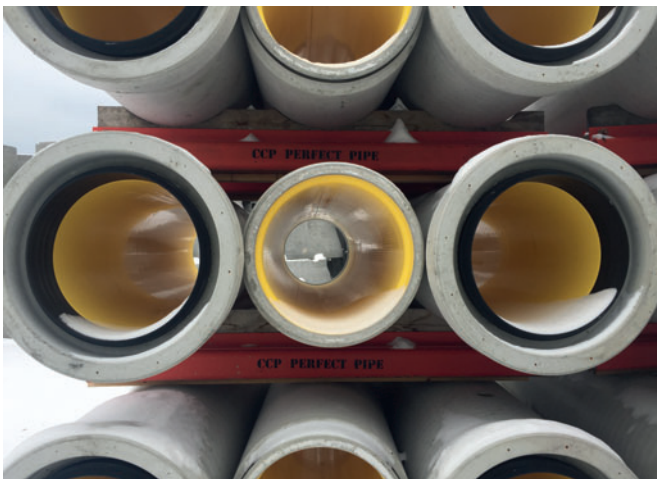
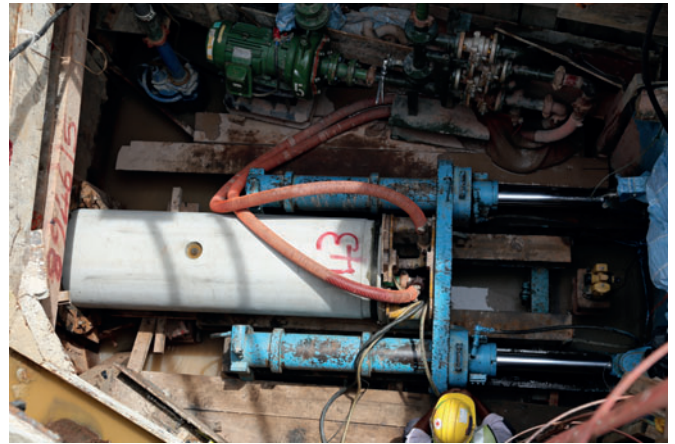
This overall efficiency can yield significant improvements in a range of areas; from the automation of wet cast production through to the handling of moulds, both before and after hardening.

ventional production process with immediate demoulding, if required.

The ongoing enhancement of Schlüsselbauer's Perfect Forming Technology production concept recently demonstrated another eye-opening result at the international trade fair, IFAT 2018, held in Munich. A corrosion-resistant box culvert with an innovative joint and variable installation position was presented to the specialists in attendance for the first time, and it will be put to use in relevant infrastructure projects across Germany from summer 2018. Two noteworthy aspects here are a corrosion-resistant non water drain with two installation positions, and the implementation of a box design with four basic internal cross-sections of 1100 x 1650 mm to 1650 x 2300 mm.



The Perfect Forming Technology concept is suitable for all kinds of infrastructure components, including pipes, manhole components or other components of a similar geometry.



Elsewhere, plastic pipes are increasingly being built into concrete or liquid soil—as a concrete pipe with firmly attached HDPE corrosion protection, Perfect Pipe brings added value back into concrete production here.

Another area of application in which the integration of innovative casting moulds has proven extremely useful for the manufacturer is in the production of concrete jacking pipes, either with or without HDPE lining. High-quality jacking pipes for non-accessible diameters have been produced in this way in North America and Singapore using Perfect Forming Technology. Focusing on consistent further development while meeting a wide range of requirements worldwide has made Schlüsselbauer a pioneer in automated production technology for mould-hardened concrete infrastructure elements. Professional and cooperative partnerships with quality-conscious precast manufacturers give both sides—concrete pro-

The essential advantages of Perfect Pipe have proven themselves in a multitude of projects in America, Asia and Europe: the product is corrosion-resistant, durably leakproof, easy to install and has a high static load capacity.

ducers and technology suppliers—a constant supply of fresh motivation and thereby contributes to generating additional value creation in concrete component plants, while also optimizing the value creation period.



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