

# Efficient production and installation: Jacking pipes from Beton Müller

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When it comes to trenchless installation, a hybrid pipe consisting of durable reinforced concrete and a corrosion-resistant plastic inner lining has been gaining traction in Europe over the past few years. Supplied by German manufacturer Beton Müller from Baden-Württemberg, the Perfect jacking pipe has since been used in numerous projects both within and outside Germany. The jacking pipes are produced following the Perfect Pipe process, which has been proven for over 10 years at Beton Müller. After manufacturing a liner cylinder including thermoplastic forming of the joints, the liner cylinder, reinforcement cage, and, if required, bentonite valves are inserted into specially designed steel moulds, which are then filled with self-compacting concrete. The pipes, which are delivered to the starting chamber, also feature a plug-in sleeve known as a connector, which allows the pipes to be connected flexibly after installation and also ensures that the finished pipeline is protected from corrosion throughout.

## Pipe ready for use without welding in the pipeline

In the past, plastic liners in concrete pipes either had to be single or double-welded in the pipeline, or a continuously protected joint was avoided altogether. The Perfect hybrid pipe does away with these complex work steps on the construction site and even provides added value thanks to the

processing of the liner material including production of the pipe joint at the concrete plant. This therefore reduces the time it takes for the contracting companies in trenchless installation and their customers to install a pipe and prepare it for use. It is not necessary to commission specialists in plastic welding, nor is additional expensive safety equipment required on the construction site. As soon as all of the tools and cables needed for jacking have been dismantled, the Perfect hybrid pipe is ready for approval and operation.

## Continuous corrosion protection despite flexible joint

Whenever one of the conditions in a pipeline project is to provide protection against chemical attack, questions always arise concerning feasibility and durability with regard to long-term use. This starts with the choice of material, includes the installation conditions, and ultimately means that pipe producers need to meet special requirements. The polyethylene liner material processed by Beton Müller on an industrial scale provides the basis for the tightness of the pipe liners. The welding and forming processes are subject to ongoing



*Datteln project, North Rhine-Westphalia, Germany: Site warehouse for DN 1200 Perfect jacking pipes from Beton Müller.*



*Datteln project: Lifting into the starting pit, piping detail with bentonite lubrication.*





*Datteln project: The next pipe is pre-pressed, while the joint is already mounted by means of plug-in connection (connector).*



*DN700 project, Medernach, Luxembourg: Starting pit*

checks by internal and external monitoring teams, and ensure that there is corrosion protection in the pipe from the spigot to the joint. The connectors perfectly complement the hybrid pipe. They are mounted in the pipe in the starting pit before the next pipe is positioned. They provide a flexible but tight connection in the pipe joint both during and after insertion, such as in the event that the pipeline is repositioned in the substrate. Two external gaskets on the connector ensure that there is always corrosion protection, even in the joint.

### **Bentonite lubrication for continuous corrosion protection**

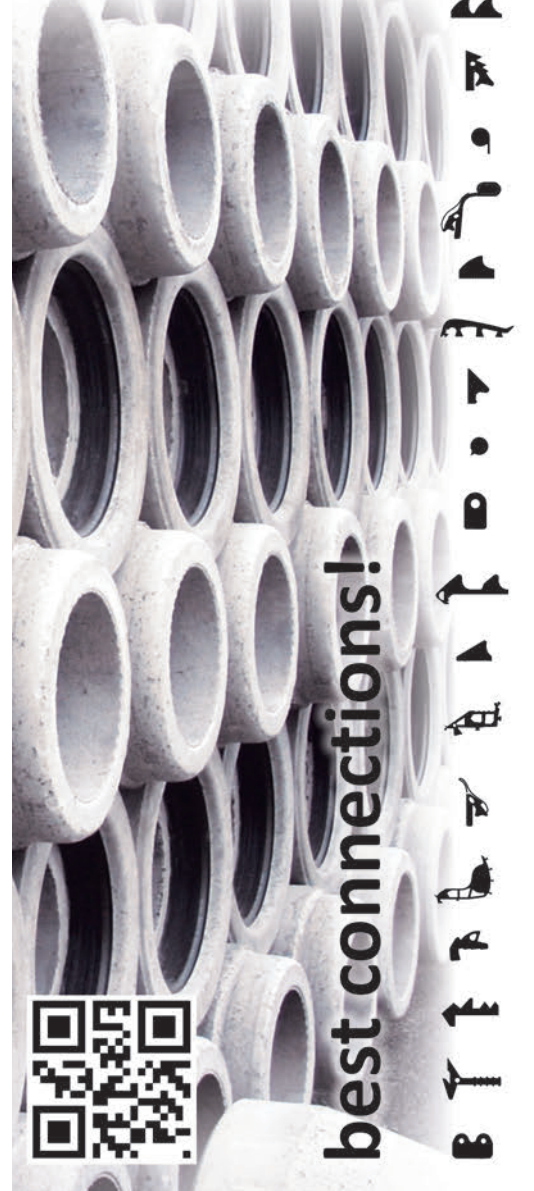
If required, valves for applying lubricant to the pipe tunnel can be installed in the factory. Depending on the pipe wall thickness, suitable stainless steel sleeves are mounted on the outside of the liner. Bentonite is applied to the outside of the pipe via these sleeves. After dismantling the feed pipe, the sleeves are sealed with another corrosion-resistant material in order to ensure continuous corrosion protection.

### **Synchronized production in the nominal widths DN 500 to DN 1200**

Beton Müller offers its customers Perfect jacking pipes in six nominal widths in construction lengths of 3 and 2 meters. The mould equipment provided by Schlüsselbauer Technology is designed to adapt quickly to the product height. To this end, maintenance-free shrink cores and easy-to-adjust bottom pallets are used, along with the necessary distance tubes. Regardless of the pipe construction length, the mouldings of the Perfect Forming Technology line ensure that the spigots of the pipe can be demoulded gently and the damage to the pipe spigots that is so often seen in competitors does not appear at all. This avoids complex improvement work and ensures consistent concrete quality. The precision of the machined mould equipment means that the accuracy of fit for the pipes including internal PE lining is always uniform. The moulds are easy to use, making it possible for Beton Müller to adapt daily production to the project requirements at short notice and keep fully hardened concrete hybrid pipes ready for delivery at all times, without additional stockpiling.



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Thermoplastic forming of the liner to the inner joint



Production of jacking pipes at Beton Müller with Perfect moulds from Schlüsselbauer Technology

**Production of the Perfect Pipe – it’s all in the details**

The fact that Beton Müller had decades of experience in the production of manholes and special components was ultimately beneficial for the first production plant for concrete pipes with plastic lining installed over 10 years ago. Despite a high level of automation, each pipe is a component in its own right that requires a high awareness of quality. Both materials—concrete and plastic—are generally easy to process. In order to meet the Perfect Pipe standards, workers in all areas of production, be it concrete technology, pipe production, or logistics, need an awareness of quality, despite extensive machine support. In the interaction between human, machine, and material, this is the only way to ensure that high-quality components can be produced each day in an economical way and brought to the construction site at a consistently high quality.

**International success: Installations in Germany, Italy, and Luxembourg**

While Perfect jacking pipes have been produced in North America and Asia, much like pipes for open trenching, for some years now (report in CPI 2/2016), Perfect Pipe products of various sizes were installed exclusively in open trenches in Europe for the first ten years from their launch on the market. The market launch in Germany is now being followed much more quickly by projects in neighboring Luxembourg and then in Italy, where the first steps have been successfully taken in Treviso with pipes with a nominal width of 800 mm. In Luxembourg, Perfect jacking pipes with a nominal width of 700 mm were used in summer 2023. The pipes produced in this way represent a key section of the sewage system in Medernach.

The nominal width class up to DN 1200 is also the initial application range for Perfect jacking pipes in Italy. Pipes with a nominal width of DN 800, DN 1000, and DN 1200 are now considered to be the logical continuation of the range of rigid pipes from Steinzeug-Keramo up to DN 600 (see [https://www.steinzeug-keramo.com/it-it/download/?file=sk-socdel-gres\\_vortrieb\\_bro\\_v12\\_web.pdf](https://www.steinzeug-keramo.com/it-it/download/?file=sk-socdel-gres_vortrieb_bro_v12_web.pdf)).



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