



Make things happen. **HOBAS**®

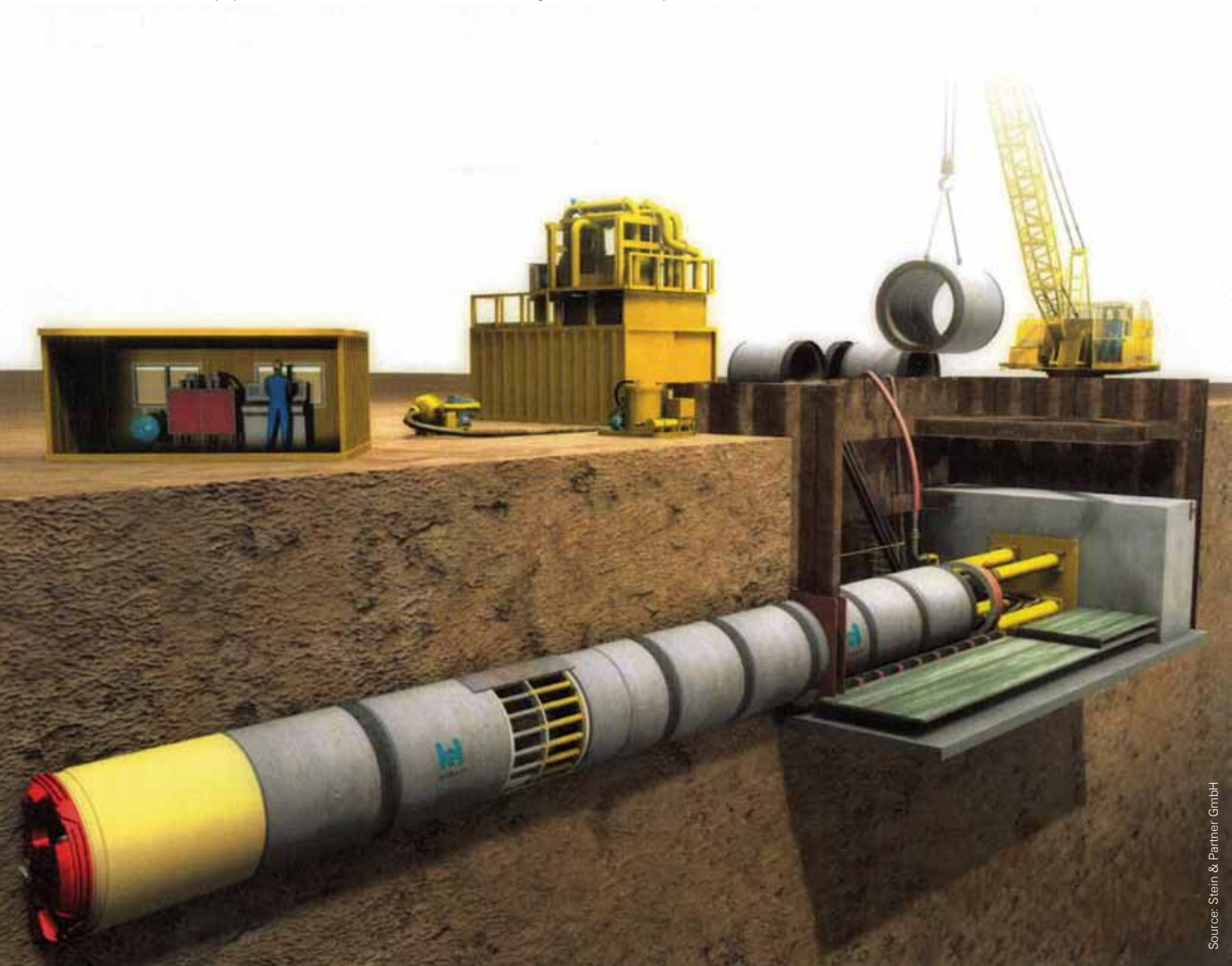
HOBAS® Jacking Pipes



Trenchless Construction - Pushing for a Better Future!

Advantages of trenchless technology

- No open trenches required – pipes are installed without the general public noticing.
- Towns and landscapes do not suffer as a result of construction work.
- Falls in the water table level, which affect vegetation, can be prevented.
- Relatively small amounts of soil are excavated and transported away.
- No special storage areas are needed for materials and equipment.
- Road traffic is not disrupted.
- Pipes can be installed irrespective of the weather.
- Local residents, nature and the environment are protected against noise, dirt and vibrations.
- Damage is substantially lower than with the open-cut method.
- Carbon emissions are considerably lower both during construction and from traffic, as congestion can be prevented.



HOBAS® Jacking Pipes

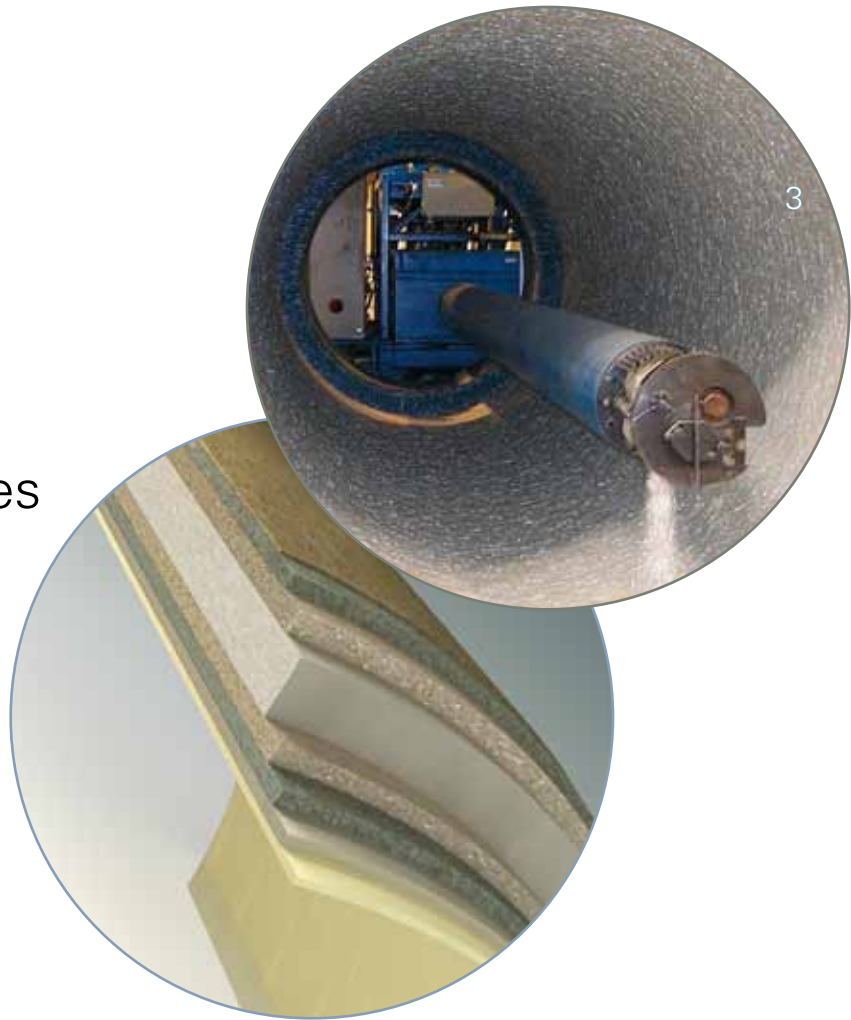
Decades of Experience

The vision of future pipeline construction emerged at the end of the 1970s: remote-controlled machines installing pipes underground. It was not just wishful thinking, as only shortly afterwards the first field test saw HOBAS DN 800 Pipes being jacked into a 10 m high embankment. In Japan, remote-controlled machines with hydraulic spoil removal already existed at that time – ideal for jacking with HOBAS Pipes. The first project using GRP jacking pipes and remote-controlled jacking machines was carried out as part of a research project in Hamburg. In 1982, pipes with an outside diameter (D_e) of 752 mm (length: 2,980 mm, wall thickness: 50 mm) were installed using a modified Iseki microtunneling machine without any problems right from the start.

This experience was so inspiring that initial projects in the man-entry diameter range soon followed. In the 1980s, over 100 km of GRP pipes for interceptors were installed in Baghdad using the open-cut method. One of the contractors proved far-sighted and installed part of his section – 500 m of HOBAS GRP DN 1800 Pipes – by jacking. The results were so encouraging that a further 1,050 m of GRP DN 1200 pipes were jacked in this construction project.

A little later, in 1986, 760 m of GRP DN 1400 pipes and 370 m of DN 1600 were installed in clayey and sandy soils in Houston, Texas, using American jacking machines with auger spoil removal. No intermediate jacking stations were required for lengths of up to 143 m and the jacking forces were usually much lower than anticipated.

Within a matter of a few decades, GRP jacking pipes have gained a firm foothold in trenchless technology and today HOBAS manufactures jacking pipes up to a diameter of 3.5 m.



Innovative Centrifugal Casting Process

HOBAS GRP Pipe Systems are made of unsaturated polyester resins (UP), chopped glass fiber (GF) and reinforcing mineral materials. In a rotating mold, the pipe wall is built up layer by layer from the outside inwards. Once all the materials have been fed into the mold, the speed of rotation is increased. Spinning at a pressure of 30 to 70 bar presses the material against the mold wall, which removes the gas, compacts and cures it. This centrifugal casting process ensures that the pipes are circular, the wall thickness uniform over the entire length and the material displays the high longitudinal compressive strength that is particularly important for jacking.

Thanks to the three-dimensional chemical bonding of the resin, the pipe as a thermoset retains its stability even in very warm environments. One of the benefits of composite material technology is that the pipe's strength properties can be customized to suit the specific load directions required.

The sandwich construction of the wall thus ensures that HOBAS Pipes can also withstand high loading without any trouble and boast a particularly long service life. Nothing but the best for our customers!



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Material Properties & Outside Diameter

The composite used for HOBAS Products has the following properties (for specific project-related values, please contact our technical service):

	Short term	Long term
Density	20 kN/m ³	20 kN/m ³
Circumferential flexural modulus	12,000 N/mm ²	4,800 N/mm ²
Flexural strain at break, circumferential	1.0 %	0.8 %
Axial compressive strength	90 N/mm ²	-

Outside diameters (D _e) available in mm*						
220	401	616	924	1348	1842	2454
251	427	650	960	1434	1940	2555
272	478	718	1026	1499	2047	3000
301	501	752	1099	1535	2160	
324	530	820	1229	1638	2252	
376	550	860	1280	1720	2400	

* Other sizes on request.

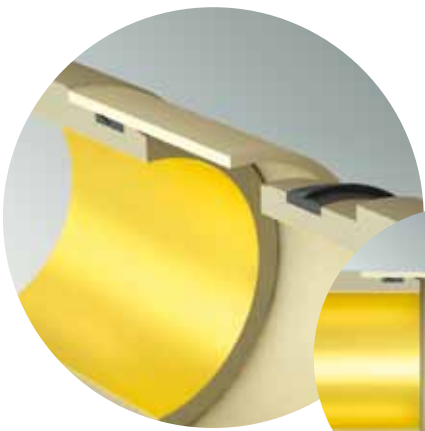
Given their high stiffness and smooth outer surface, HOBAS Jacking Pipes are also suitable for very long drives. Over 900 m have for example been jacked with HOBAS D_e 3000 Pipes.

HOBAS Jacking Pipes are produced in standard lengths of 1, 2, 3 and 6 m (tolerances to company standards). Other pipe lengths can also be supplied on request.



HOBAS® Joints for Jacking Pipes

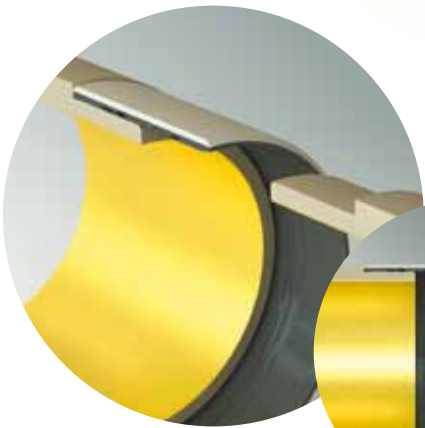
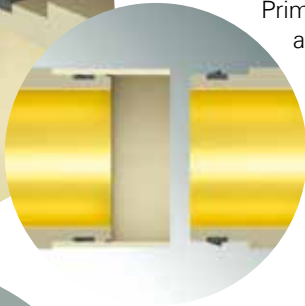
HOBAS Jacking Pipes are flexible and leak tight when joined with the following couplings, depending on the environmental requirements:



GRP Coupling

The GRP coupling is made of glass fiber reinforced polyester resin.

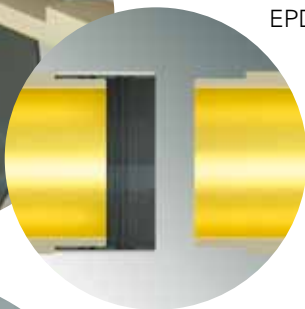
Primarily used for larger diameters, it features a sliding seal for leak tightness.



FWC Coupling for Pressure Jacking Pipes

The FWC coupling is made of glass fiber reinforced polyester resin with an integral full width EPDM gasket and is fitted to the pipe wall.

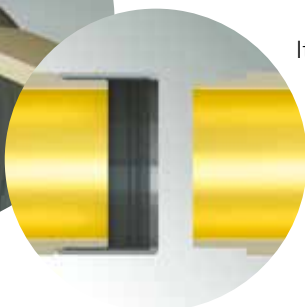
This coupling is used as standard for the various nominal pressure ratings of HOBAS Pressure Pipes. Jacking pipes with this coupling can be operated as pressure pipes right away.



Stainless Steel Coupling

The stainless steel coupling consists of a stainless steel ring with an EPDM seal firmly attached to it.

It is used as standard for smaller and medium nominal width pipes.



Supplementary **HOBAS**[®] Products

Upstream and Downstream Pipes for Intermediate Jacking Stations

An intermediate jacking station is often used when additional thrust may be required due to the soil conditions or drive lengths. It enables the complete pipeline to be divided up into more easily jackable sections. HOBAS supplies upstream and downstream pipes specially manufactured for intermediate jacking stations to customer specifications. The dimensions of the pipe ends are tailored to the steel cylinder used. They are joined with double seals on the downstream pipe and usually lubricated in addition.

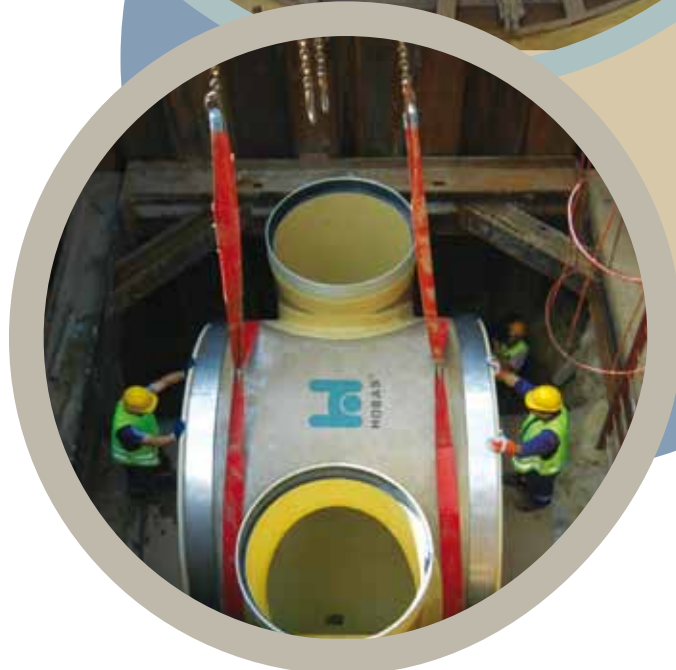
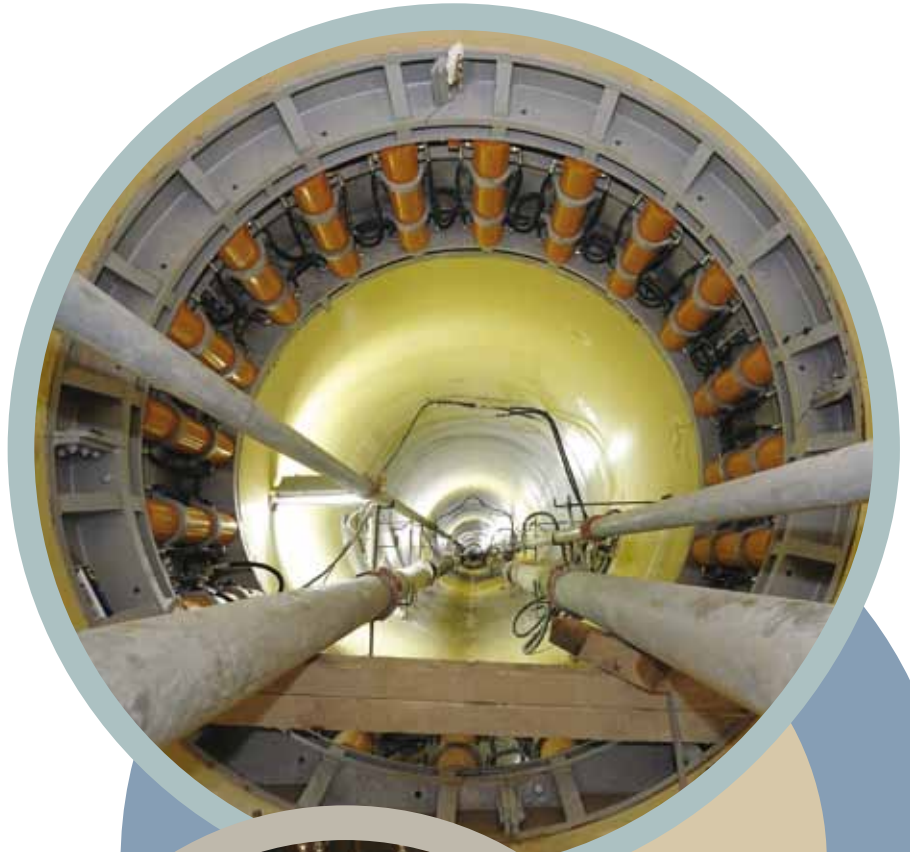
Lubrication - Injection Nozzles

Injection nozzles are for pumping a lubricant and/or drilling fluid into the gap between the jacking pipe and the soil. HOBAS incorporates these nozzles made of a corrosion-resistant material into the pipes. The injection nozzles are securely fitted to prevent turning, have a female thread and a plug for sealing. The jacking companies specify the number, size and location for each project; $\frac{3}{4}$ " to 1 $\frac{1}{2}$ " ports are generally used.

Manhole Structures for Jacking Sites

HOBAS Manhole Structures can be installed after jacking – for example when the intermediate jacking stations are removed – as standard or tangential manholes. The manhole design is customized to suit the actual location and height constraints of the pipeline involved. In addition, tangential manholes can naturally also be placed on the jacked pipeline.

HOBAS Manholes are supplied as complete components without requiring any protective coatings or sealing work. They can be connected to other materials without any problems and installed quickly and easily.



Uncompromising Quality and Service

HOBAS® Quality: Nothing but the Best!

The quality and environmental management systems in place at all HOBAS Subsidiaries comply with the latest requirements of ISO 9001 and ISO 14001 and are certified by independent institutes. Uniformly high quality standards are a key feature of HOBAS Products and firmly rooted in the corporate philosophy. The quality management system covers all areas in the individual companies, including new product development, quality control processes, shipping and service – what you receive is consistently high quality without any ifs or buts.

Our comprehensive quality control program not only meets international standards but also takes special customer specifications into consideration. HOBAS holds the octagon quality mark issued by Germany's TÜV technical service and many other approvals. Auditors from renowned certification companies keep a permanent check on us, carrying out tests and inspections. Our internal HOBAS Quality Control Program also includes the following quality assurance measures:

- Testing the raw materials
- Testing the semi-finished products
- Testing the services
- Release testing for production
- Strength testing on finished products
- Visual inspection and dimension checks on finished products
- Hydrostatic and hydrodynamic testing
- Calibrating the instruments
- Ensuring the identification and traceability of the products
- Checking planning and design
- Checking the suppliers

HOBAS Employees in the research and development departments, application engineering and installation teams are highly qualified and very dedicated. State-of-the-art technical equipment and cooperation with internationally recognized institutes and experts are your guarantee for a comprehensive, optimal service.

Reliable Service

As a system supplier, HOBAS attaches great importance to service. Our experts will support you to ensure that your project runs smoothly – from initial planning right through to completion. HOBAS is committed to providing customers worldwide with a broad product range and professional support.

This includes:

- Technical advice for planning, installation and rehabilitation
- Static calculations to comply with various regulations
- Hydraulic calculations
- Design and drawings for manholes, structures and special constructions in 2D and 3D
- Consultancy, training and support for contractors
- Installation services
- Technical documentation and information material
- Development of custom fittings and special pipes
- Logistics service

Our engineers can provide feasibility studies and accurate technical drawings so that you can be sure you have selected the right material. Hydraulic and static calculations are just as much part of the service as are the HOBAS Pipe Consultants who are on site during construction work to ensure that even the most difficult challenges can be overcome without a hitch.



Jacking with **HOBAS**[®] Pipes: Impressive Benefits

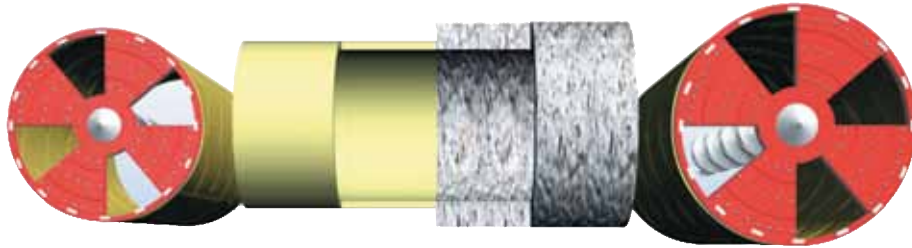
High Compressive Strength

HOBAS Jacking Pipes feature high compressive strength and, compared with conventional materials, a good ratio of wall thickness to inside diameter. Smaller outside diameters and lower weight are the resultant advantages. Where outside diameters are comparable, HOBAS Pipes have larger inside diameters and – thanks to the particularly smooth inner surface – display unbeatable hydraulic characteristics.

Smaller Outside Diameter – Lower Machine Costs

The smaller outside diameter in relation to comparable inside diameter leads to an array of advantages. Smaller machines are required for the pipes, for example, which means lower equipment and lease costs. This results in considerable savings for larger diameters in particular, especially if the equipment class has to be changed. In addition, the costs for construction site and thrust pit preparation can also be substantially reduced.

HOBAS Pipes compared with traditional materials: a similar inside diameter, but a much smaller outside diameter and therefore smaller cutting head, smaller jacking machine, less excavated material and above all lower costs!



Smaller Outside Diameter – Less Excavation

A smaller outside diameter requires a smaller borehole, which in turn means less soil to be excavated, carried away and disposed of. Compared with alternative materials, HOBAS Pipes can save over 50 percent in spoil, depending on the pipe diameter.

What is more, less bentonite is used for lubricating smaller outside diameters and smoother surfaces, thus further reducing costs.

Lower Jacking Forces Required

Given that the outer surface is impermeable, HOBAS Jacking Pipes only absorb very little water and do not adhere to damp soil material. There is therefore comparatively low resistance when starting jacking, even after longer standstills. HOBAS Pipes' smooth outer surface is also a guarantee for low friction during jacking, thus enabling impressively long drives without the need for intermediate jacking stations.

But that is by no means all!
HOBAS Pipes also feature:

- Pipe design, manufacture and installation drawing on decades of experience
- Perfect dimensional accuracy
- Variable pipe lengths (to customer specifications)
- Low weight and practical push-to-fit couplings
- High abrasion resistance (inside and outside)
- Very smooth inner and outer surfaces ($k \leq 0.01$ mm)
- High chemical resistance
- High jacking forces possible
- Low-absorption outer surface
- High stiffness
- Angular deflection possible in couplings
- Very long service life of up to 100 years
- Installation irrespective of weather
- Complete pipe system including manholes and fittings
- Simple to cut and adjust, also on site
- Easy handling

On the following pages you can assure yourself of the advantages and gain an impression of the engineering challenges that can be met with HOBAS Jacking Pipes. The reference projects describe pipes installed around the world and include some very old projects, jacking very large diameters, pressure and curved pipe jacking, and trenchless installation in sensitive areas such as under a railroad line.



Premiere in Hamburg in 1982

The First Large-Scale and Technically Demanding GRP Jacking Project in the World, DE

Year of Construction

1982

Total Length of Pipeline

165 m

Diameter

D_e 752

Wall Thickness

50 mm

Application

Sewer

Special Features

**highly accurate jacking
even in the early 1980s,
no disruptions to traffic
and industry**

HOBAS made its debut with Centrifugally Cast GRP Jacking Pipes in 1982. Before then, the pipes had only been used on some test construction sites in northern Germany for pushes of up to 50 meters. The world's first large and technically highly demanding jacking project with GRP products was undertaken at Hamburg's customs port.

A sewer was to be installed under a very busy part of the port in the north of Germany. The specifications were challenging: a fire service exit, port railway and federal railway lines were not to be disrupted under any circumstances and settling had to be prevented over the entire length of the pipeline. Given the fact that trenchless construction saves space and is highly accurate, jacking was truly predestined for this application. The HOBAS Products' corrosion resistance also to aggressive wastewater, their smooth outer surface and easy handling persuaded the clients and they ordered jacking pipes with an outside diameter of 752 mm and wall thickness of 50 mm. The pipes were installed six meters under the groundwater table in two drives over a length of 165 meters without any intermediate jacking stations.

Although their outer surface is very smooth, the HOBAS Pipes were lubricated with bentonite every 30 meters to reduce friction and speed up the jacking work. It is hardly surprising therefore that the greatest jacking force used was only 1700 kN, which is far less than the limit for the pipes. What is also remarkable is the great precision with which the HOBAS Pipes were jacked through the silt and clay soil under the groundwater table at that time: the pipeline only deviated 15 mm from the planned route over a length of more than 100 meters, thus remaining well below the specified tolerance.

The facts sounded spectacular then but are now exceeded many times over. In 2009, HOBAS supplied D_e 3000 jacking pipes that were installed without using the intermediate jacking stations in sections of almost a kilometer...

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HOBAS® Goes XXL

Pipes De 3000 Jacked under Warsaw, PL

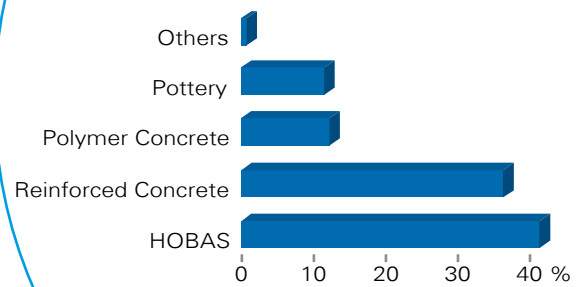
The project to establish the collector leading to the new wastewater treatment plant Czajka in Warsaw was broken down into three sections. The first is 5,714 m long and was realized with HOBAS Jacking Pipes D_e 3000 which were installed along the right side of the Vistula, whereas 1,400 m HOBAS Pipes D_e 3000 pipes are laid within the second part and on the left river bank. The pipelines meet in the third section where two lines DN 1600 are inserted in a 4.5 m diameter concrete tunnel traversing beneath the Vistula.

The contractors Hydrobudowa 9, PRG Metro and KWG (all belonging to the PBG Group) worked as consortium on the first project section. Worthwhile mentioning is the 840 m long part of the first section where the pipes were supposed to be jacked from both ends meeting in the middle. However, installations with HOBAS Pipes can be conducted so precisely that the section could be jacked with one single drive and from one side only. The smooth and even outer surface and high stiffness of the relatively light-walled HOBAS Pipes were significant for this success. Despite the small friction and low forces needed to jack HOBAS Pipes, the contractor followed the project plan and erected an intermediate station every 100 m. None of these but the last was put into service to make sure that also the last drive at 1,200 tons would run smoothly. After completing the works the intermediate stations were replaced by HOBAS Tangential Shafts and reused for different sections in the project.

For the consequent section, pipes were jacked beneath the main road of the district Białołęka. An open trench would not have been possible here since the construction works would have impaired the traffic on this important road (3 lanes in each direction). The pipeline route runs beneath the middle, the green line, of the road and a single drive over 910 m broke the record of longest single drives in the project.

Within the second part of the project, the contractors POL-AQUA and Sonntag Baugesellschaft mbH laid 1,400 m HOBAS Pipe D_e 3000 almost unnoticed by the population and also via jacking on the left side of the Vistula.

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Market share of jacking pipe materials in Poland
Source: Inżynieria Bezwykopowa journal, March 2008

Year of Construction	2009 - 2010	Client	Waterworks Warsaw
Construction Time	21 months	Contractors	PBG Group:
Total Length of Pipeline	7.1 km		Hydrobudowa 9, PRG
Diameter	D_e 3000		Metro and KWG;
Pressure Class	PN 1	Special Features	POL-AQUA, Sonntag
Stiffness Class	SN 40000 - 64000		Baugesellschaft mbH
Application	Sewer		Jacking with very large pipes, low weight of HOBAS Products, very smooth outer surface, high stiffness

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Curved jacking with pressure pipes at a depth of 32 m in Basel

Who Invented It?

Basel:

Year of Construction

2009

Construction Time

1.5 months

Total Length of Pipeline

433 m

Diameter

D_e 1499

Wall Thickness **79 mm**

Pressure Class

PN 10

Stiffness Class

SN 160000

Application

Cooling water line

Special Features

Jacking pressure

pipes at great

depth, curved

pipe jacking

under the

Rhine

Round the Corner under the Rhine, CH

What was originally planned as a double pipeline without curved jacking – the actual pressure line was to be located inside a protective pipe made of reinforced concrete – was redesigned by HOBAS Experts as a single pipeline. It was then installed by curved jacking: the Swiss have always been pioneers where innovation is key...

The pipeline involved was a water supply line for cooling purposes that went under the River Rhine in Basel. HOBAS supplied pressure jacking pipes in PN 10, outside diameter 1,499 mm for it. The entry pit was no less than 32 m deep to avoid underground water courses and endangering the Rhine's water. At this depth, it was possible to drive through one horizontal soil layer whereas traversing different formations beneath the Rhine would have posed additional risks for what was already a highly complex project. As the exit pit was located at a depth of 28 m, the pipes were jacked four meters uphill over the length of 433 m. To prevent the border between France and Switzerland from being crossed, the contractors pushed the pressure jacking pipes in a curve with a radius of 1,000 m. Here too HOBAS Pipes proved how impressive their unique properties are.

A Pipe Arch for the Railroad under Zürich's Historic Center, CH

What do you do when you want to link two stations under a densely built-up area, but do not want to disturb the public or disrupt the traffic flow and cannot simply move the historic buildings to one side? The answer is simple: you use HOBAS Jacking Pipes to form a pipe arch that reliably supports the part of the town above it. Then you can safely bore the tunnel for the railroad.

Construction of the urban Weinberg Tunnel placed considerable demands on the contractors. As there is not much soil cover in the area of the station, a large pipe arch was jacked before building the tunnel to prevent the buildings and roads above the site from subsiding. The arch consisted of seven sections using HOBAS Pipes in D_e 1940, which were installed in a semi circle above the tunnel partly under the River Limmat. These pipes were then filled with concrete to meet the structural requirements for building the actual railroad tunnel. Trains are scheduled to start running through the Weinberg Tunnel in 2013, which will enhance Zürich's infrastructure considerably.

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Zürich:

Year of

Construction

2009 - 2010

Total Length of Pipeline

1,500 m

Diameter

D_e 1940

Pressure Class

PN 1

Stiffness Class

SN 32000 - 40000

Application

"Support structure"

Client

SBB - Swiss Railways

Special Features

Highly space-saving installation right beside the station, low weight

Under Zürich's old town – without the public noticing

St. Mark's Square, Rialto Bridge and **HOBAS**[®] Pipes

Jacking with **HOBAS**[®] Pressure Jacking Pipes under the Lido in Venice, IT

Both industry and agriculture in the surrounding area have caused the lagoon in Venice to become increasingly polluted in recent years. In 2000, a plan was therefore developed to prevent pollution and improve water quality in the catchment area emptying into the Venice lagoon. The project was aimed at converting the existing treatment plant in Fusina so that it can process the sewage from local households, stormwater from Mestre, Marghera and Mirese, industrial effluent and polluted groundwater from Marghera harbor. A 20-km-long outlet will then convey the treated wastewater to the sea.

In order to cross the Lido sandbar, 351 m of DN 1400, PN 6 pipes had to be installed by jacking. "We spent a long time looking for pipes that suit our requirements," explains engineer Meneghini, site manager at Mantovani SpA. "After a great deal of research, we chose HOBAS Pipes, as they combine two key characteristics that we need: the mechanical strength of a jacking pipe with the hydraulic properties and leak tightness of a pressure pipe. Normally, two different pipe systems would have to be used to meet such demands."

The 3-m-long HOBAS GRP Pipes with a wall thickness of 85 mm and D_e 1720 were designed for a maximum jacking force of 6,926 kN and an internal pressure of 6 bar. This enabled them to comply with the project specifications and withstand crossing the Lido. Contrary to original assumptions, the entire 351 m section was jacked in one single drive. Although three intermediate jacking stations were planned, none were used because the very smooth outer surface of the HOBAS Pipes significantly reduced the jacking force required. GRP pipes with their excellent ratio of wall thickness to inside diameter allowed a smaller machine to be used than would have been possible with concrete. This not only meant there was less work involved, but also resulted in less spoil to be removed – important factors that reduced the installation costs to a minimum. As the contractor and HOBAS Specialists cooperated extremely well, construction work on the pipeline was completed in less than a month.

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Year of Construction

2009 - 2010

Total Length of Pipeline

351 m

Diameter

D_e 1720

Pressure Class

PN 6

Stiffness Class

SN 140000

Application

Sea Outlet

Client

Impresa Costruzioni

Mantovani SpA

Contractor

Icop SpA

Special Features

Pressure pipes' excellent

hydraulic properties,

smooth inner surface,

low installation costs,

low friction coefficient,

low weight



Year of
Construction

2004-2006

Total Length
of Pipeline

5.3 km

Diameter

DN 200 - 2400

Pressure Class

PN 1

Application

Sewer

Client

City of Vienna

Special Features

Jacking on a very tight schedule, confined spaces, pipe material can be used for various installation methods, suitable fittings and manholes can also be supplied

Jacking in Three-Quarter Time

HOBAS® Jacking Pipes under Vienna, Austria's (Waltzing) Capital

In Vienna in Austria, the old Blumental wastewater treatment plant was closed down and sewage then had to be conveyed to the large Vienna-Simmering plant. A new interceptor therefore had to be built. The project specifications were exceptionally challenging: regarding the pipe material, for example, the City of Vienna demanded a minimum service life of 100 years. The products had to be suitable for both open-cut and trenchless installation, and fittings and manholes also had to be supplied. Not only did the pipes and shafts have to be absolutely leak tight, but also pass a compressed air test at 0.1 bar. And as if that was not enough, the client insisted on a very close schedule: the 5.3-km-long pipeline had to be installed in the city center and ready for operation within 922 calendar days.

HOBAS Products are just made for such challenges and also feature a whole range of other benefits:

- The flexible centrifugal casting process enables us to vary the HOBAS Pipe design to suit the installation method and the specific conditions on site. In this project, the pipes had to be jacked in some places because of the confined spaces. No problem with the custom HOBAS Pipes.
- Our HOBAS Experts drew up a tight schedule for the deliveries for the project. Working closely together with the contractor, we thus achieved an installation rate of more than 30 m a day. The easy handling of HOBAS Pipes and fast joining with leak-tight push-to-fit couplings speeded up the installation process considerably, while the very smooth outer surface of the pipes reduced the jacking forces required, also contributing to the project's success.

As buildings and bridges lined the new pipeline route, a total of nine sections had to be installed by jacking. Even jacking a curve with a radius of 580 m and a gradient was no problem with HOBAS Jacking Pipes. Today, the operators can look back with great pride on what was a successful project all around.

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On the Right Track with **HOBAS®**

HOBAS® Jacking Pipes Installed under a Railroad, LU

Installing pipelines that run under railroad lines is always a difficult undertaking. While you can usually close roads for limited periods and divert traffic, when it comes to trains construction poses far greater problems. This is why engineers tend to opt for trenchless technology, particularly for railroad projects. An added bonus is that very long pipelines can also be jacked without visible construction sites at the surface.

Not only the installation method but also material selection calls for careful consideration. Electric rail systems create electromagnetic fields during operation, which can lead to corrosion in materials such as steel or cast iron. In addition, leakage current could flow to the metal components in the pipes. Risks that have to be avoided at all costs.

A new pipeline running under railroad tracks was planned in Ettelbruck in Luxembourg. Various networks were then to be installed in the pipeline. The planners initially selected a protective concrete pipe but soon changed their minds when they heard about the unbeatable benefits of HOBAS Jacking Pipes. Built up layer by layer, the GRP pipes do not contain any metal components and are both corrosion resistant and non-conducting. Leakage current does therefore not affect HOBAS Pipelines.

In February 2009, HOBAS Pipes (D_e 1720) were jacked under the railroad at a depth of 3 m. After installation, the pipeline was filled with a 25 cm thick layer of concrete to facilitate future maintenance work on the third party lines inside it. Once construction had been completed, the client and contractor alike were impressed by the rapid installation rate and very pleased with the pipes' low weight and small outside diameter, which meant that the jacking pits were much smaller than anticipated. Quality from HOBAS – solutions for all situations!

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Year of Construction	2009	Application	Protection Pipe
Construction Time	3 days	Client	SIDEN
Total Length of Pipeline	40 m	Contractors	Kuhn, K-Boringen
Diameter	D_e 1720	Special Features	Jacking under a railroad line, fast installation, low weight, small outside diameter
Wall Thickness	68 mm		
Stiffness Class	SN 64000		





HOBAS Group Worldwide

HOBAS manufactures and markets HOBAS CC-GRP Pipe Systems. The HOBAS Network includes HOBAS Production Facilities and Sales Organizations in Europe and throughout the world.

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When developing and manufacturing HOBAS Products, we are dedicated to conserving resources and respecting the environment. Visit our website to find out more about the HOBAS Environmental Policy.