

HOBAS[®] Relining Pipes



As Good as New: Relining with **HOBAS**[®] Pipes

Rehabilitation Means New Not Repaired Pipes

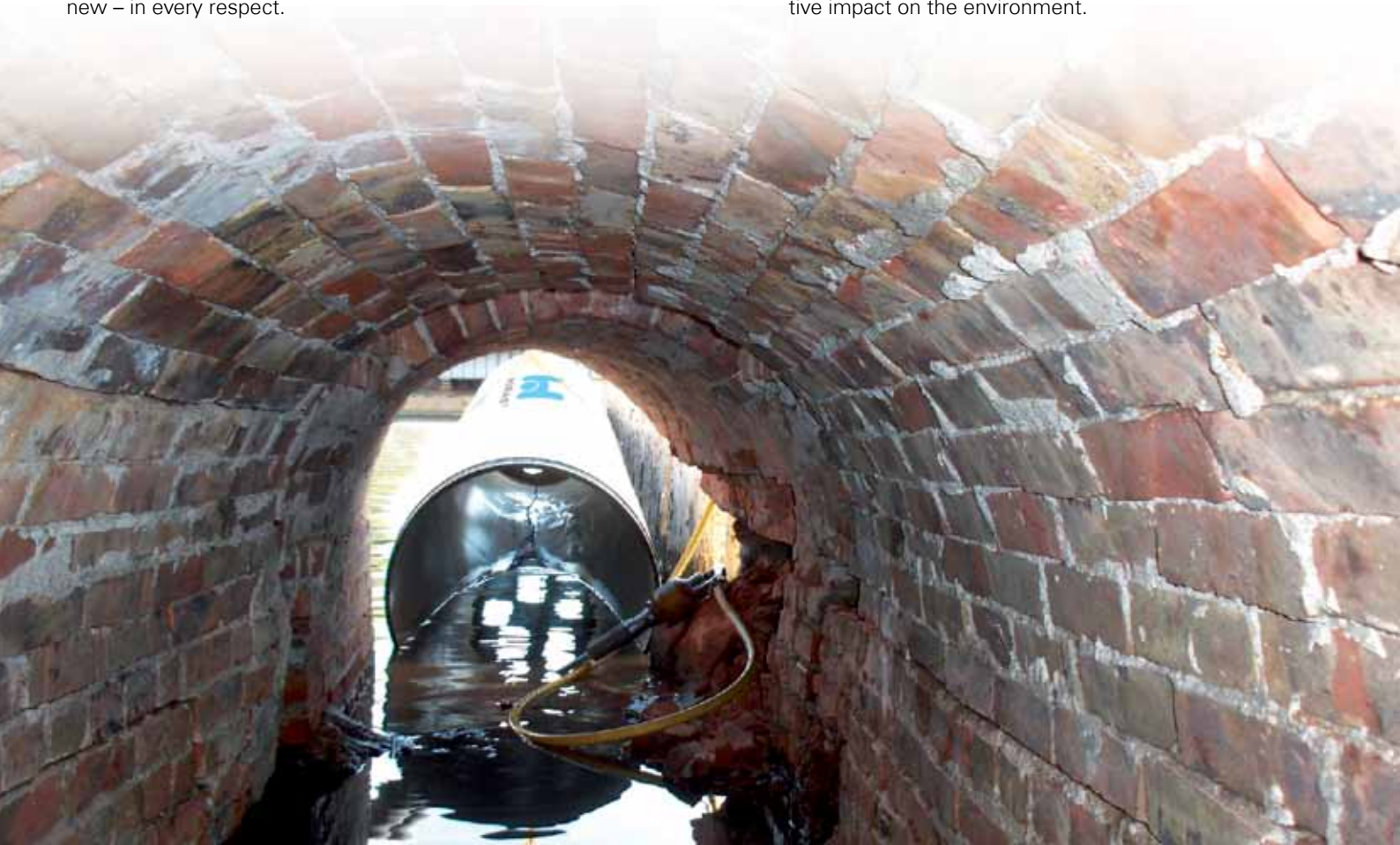
When it is no longer feasible to carry out spot repairs on old pipelines, you have a choice either of successively replacing all the pipes or rehabilitating. The great disadvantage of replacing entire pipelines is that it is not only extremely expensive but also leads to tremendous disruptions, particularly in urban areas where the largest and most complex sewer systems are to be found. A convenient solution to this problem is pipe rehabilitation – for example in the form of relining.

Relining has an unbeatable advantage: the old pipeline is replaced quickly and easily and the client then has a pipe that is of the same quality as a new one in every way. The relining process involves pushing or pulling the new pipes into the existing pipeline and filling the remaining annular space between the host and liner pipes with pressure-resistant grouting, usually a mixture of binding materials. This fixes the inserted pipe in position, making it responsible for the complete structural load capacity. HOBAS Relining Pipes are particularly suitable for pipe rehabilitation, as they are of low weight, corrosion resistant, quality assured, easy to install and resist the load from the grouting without any trouble. To put it in simple terms: relining is as good as new – in every respect.

For the Sake of the Environment

HOBAS Relining Pipes seal old sewers and ensure that the soil and groundwater are reliably protected against wastewater. As environmental protection is not restricted to this area, our commitment to conservation can be seen throughout the entire product life cycle. During the production process, pipe transport, installation, operation, and in our employees' everyday lives, we ensure that we not only do the bare minimum required but also take every opportunity we can to protect the environment.

The environmental management system in place at HOBAS Subsidiaries conforms to the requirements of the ISO 14001 standard. As part of our corporate social responsibility, we improve our life cycle assessment year on year. Cost- and energy-efficient management of raw materials and production processes is a matter of course for us, as is minimizing resource use and negative impact on the environment.



So You Can Rest Assured

Top Quality

Certified by independent institutes to various international standards, the HOBAS Plants ensure that the finished products meet the most stringent customer specifications. Compliance with ISO 9001 and uniformly high quality standards are key features of HOBAS Products and firmly rooted in our corporate philosophy. The quality management system covers all areas in the individual companies, from new product development through to 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 and our specialists in the HOBAS R&D departments, application engineering and installation teams ensure that you can rely on consistently high, uniform quality no matter from what country the pipes are delivered to you. Our internal HOBAS Quality Control Program also includes the following quality assurance measures:

- Testing the raw materials
- Testing the semi-finished products
- Quality assured 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

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.

A matter of course for us:

- Technical advice for planning, installation and rehabilitation
- Feasibility studies
- Structural analyses to comply with various regulations
- Hydraulic calculations
- Design and drawings for manholes, structures and special units in 2D and 3D
- Consultancy, training and support for building contractors
- Installation services
- Technical documentation and information material
- Development of system-building-units and special pipes
- On-site support during construction work from HOBAS Pipe Consultants



HOBAS® Relining Pipes: Your Benefits at a Glance

HOBAS Relining Pipes have the well-known HOBAS Pipe wall structure with the characteristic resin-rich inner layer. Thanks to the sophisticated design, you can rely on the following advantages:

Benefits During Installation

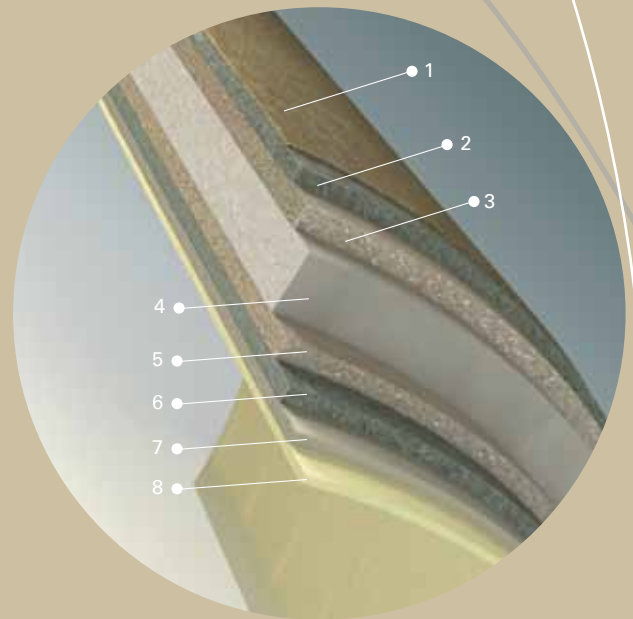
- Easy installation given the various jointing systems
- Constant outside diameter and simple cutting, also on site
- Uniform outside diameters and couplings flush with the outside diameter make it easier to install the pipes, as there are no projecting parts in the way
- Little space required on site
- Installation possible irrespective of the weather
- Compatibility with other materials

Benefits When Operating the Rehabilitated Pipeline

- The pipe walls are relatively thin but comparatively strong, which makes maximum use of the nominal width selected
- The smooth mirror-like inner surface prevents incrustations from forming and provides adequate hydraulic reserves, even if flow rates are low
- The same quality standards, tests and external quality control as for pipes for new installations
- Relining creates a completely stable pipe system that is as good as new in structural terms – perfect rehabilitation
- Seamless quality throughout the complete rehabilitated system

Benefits for the Environment

- Little disruption to traffic
- Minimal noise disturbance
- Towns and landscapes do not suffer as a result of construction work
- Falls in the water table level, which affect vegetation, are prevented
- Soil is not excavated



Pipe Wall Structure*

- 1 External protective layer
- 2 Outer reinforced layer (glass fiber, thermosetting plastic)
- 3 Transition layer (glass fiber, thermosetting plastic, sand)
- 4 Reinforcing layer (sand, thermosetting plastic, glass fiber)
- 5 Transition layer
- 6 Inner reinforced layer
- 7 Barrier layer
- 8 Inner pure resin layer

*Schematic illustration of in reality seamlessly merged pipe wall construction. Layer design is adapted to suit requirements set by e.g. the conveyed medium, installation method, pressure, external forces, etc.

HOBAS[®] Pipe Diameters

From Tiny to Titanic

HOBAS Relining Pipes can be supplied in the following sizes:

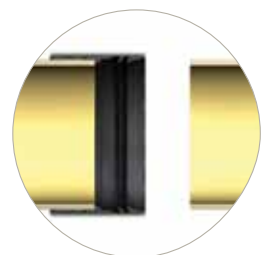
Available diameter DN D _e in mm*						
150 168	400 427	650 650	960 960	1400 1434	1940 1937	2555 2555
200 220	450 478	700 718	1000 1026	1500 1499	2000 2047	3000 2999
250 272	500 501	750 752	1100 1099	1535 1535	2160 2160	3270 3270
300 324	500 530	800 820	1200 1229	1600 1638	2200 2250	3600 3600
350 376	550 550	860 860	1280 1280	1720 1720	2400 2400	
400 401	600 616	900 924	1348 1348	1800 1842	2400 2453	

* Other diameters on request.

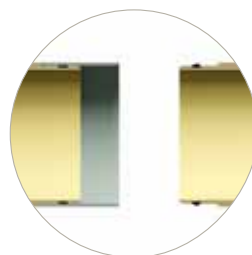
HOBAS Relining Pipes are produced in standard lengths of 1, 2, 3 and 6 meters (tolerances to company standards). Other pipe lengths can also be supplied on request.

System Building HOBAS[®] Products

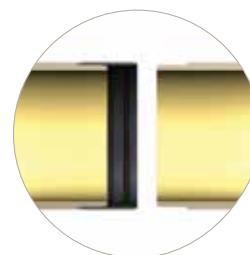
HOBAS Relining Pipes can be joined using various different couplings to suit the environmental conditions and meet the contractor's or client's specifications.



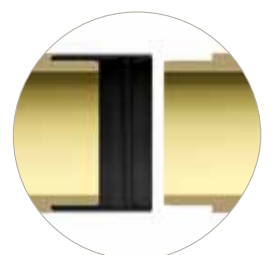
FWC Coupling



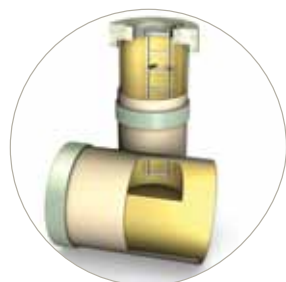
GRP Sleeve



Stainless Steel
Coupling (FS)



Pressure Jacking
Coupling (PJC)



Tangential Manholes

HOBAS Shaft Structures are supplied as complete, dimensionally accurate components. Installation is quick and easy – no protective coatings or sealing work is required and they can also be connected to other materials without any problems. Our experts will be happy to provide you with advice on your manhole in proven HOBAS Quality.

Installing **HOBAS**[®] Relining Pipes

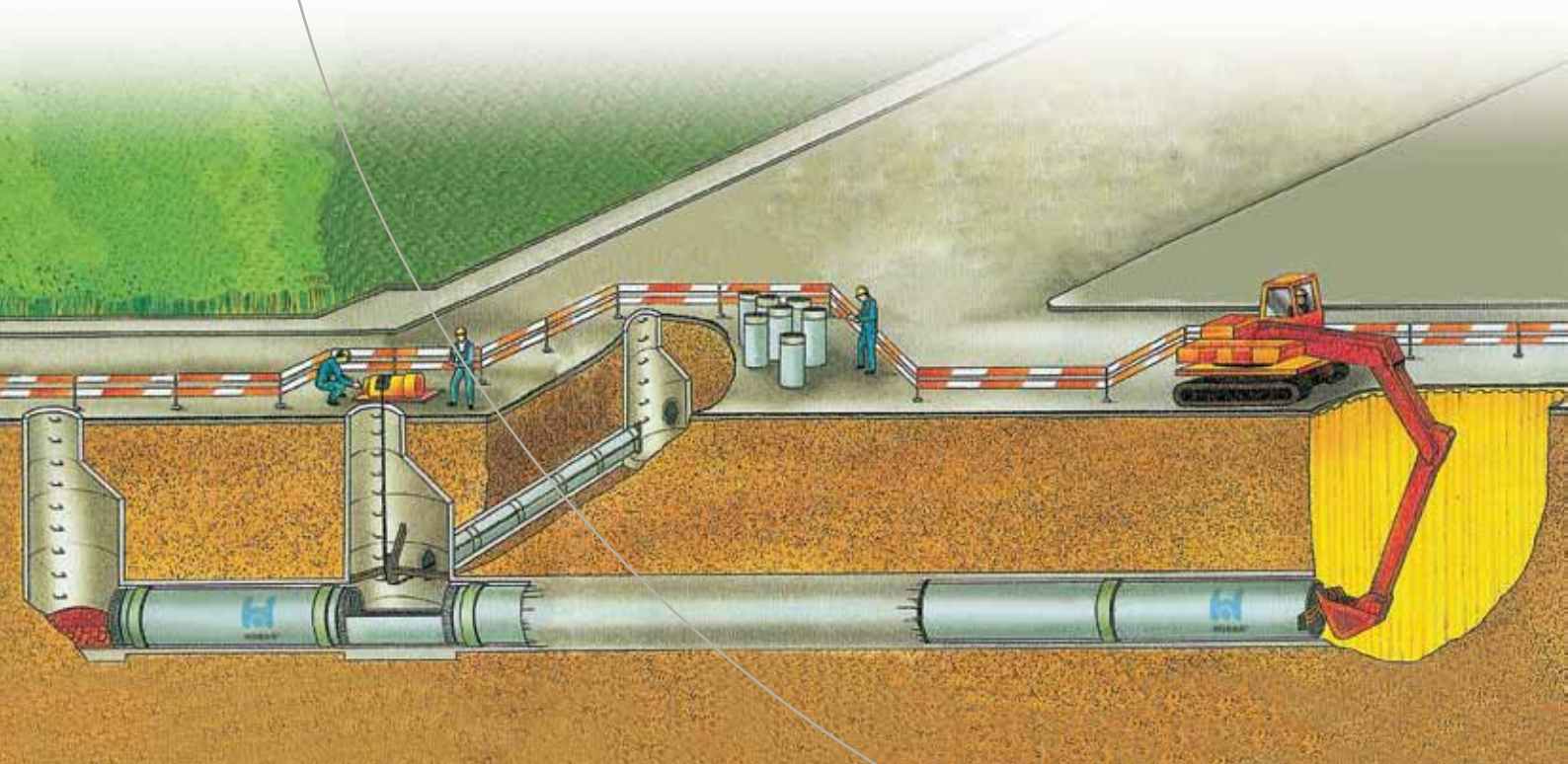
Relining creates a new, leak-tight “pipe within a pipe” system, which is as good as new in both structural and hydraulic terms. The remaining annular space between the host and liner pipes is filled with grouting, fixing the new pipeline in place.

HOBAS Relining Pipes can be inserted in the existing pipeline using the following methods:

- Pushing
- Pulling
- Floating
- Driving
- Bursting

1 | Pushing Relining Pipes

The pipes are joined in an entry pit or launch shaft and – as shown in the diagram below – pushed into the existing pipeline length by length using a jacking machine or excavator.





2 | Pulling Relining Pipes

The relining pipes are joined in a pit or shaft. Next, a steel cable is pulled through the old pipeline and the relining pipes from the exit shaft and attached to a cross bar at the end of the pipeline. The liner pipes are then pulled with a winch located in the exit shaft. Pipes with locked couplings can be installed in the same way, but the steel cable can also be attached to the start of the pipeline.

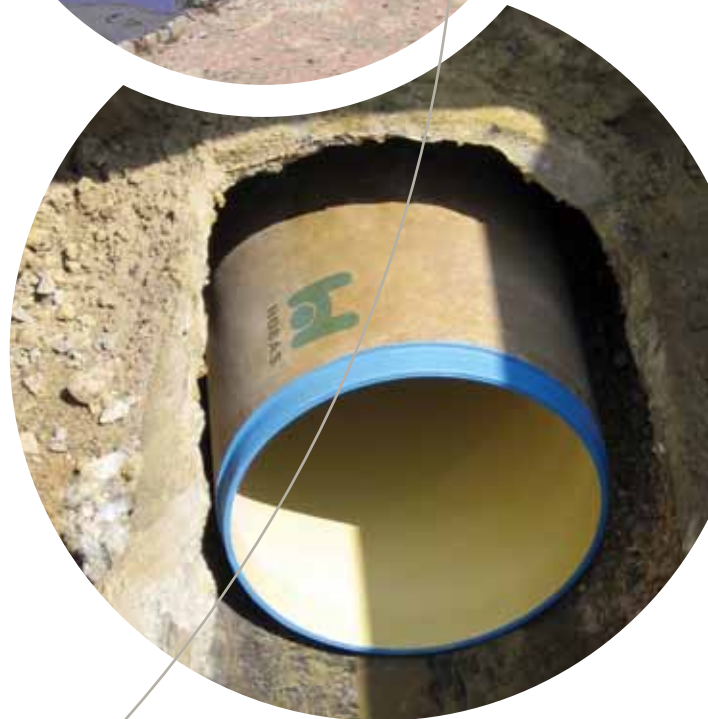


3 | Floating Relining Pipes

If the sewer joints are offset to any great extent, the floating method is better for installing the lining pipes. Unless the line to be rehabilitated has to be cleaned, the pipes can even be inserted live, i.e. with the wastewater still flowing. The medium then flows through the pipe and annulus, which causes it to float and makes insertion even easier.

4 | Driving Relining Pipes

The pipes are raised by a special vehicle until there is enough ground clearance for conveying them to their destination. There they are joined to the last relining pipe. This method is highly suitable for relining man-entry nominal widths and enables very high installation rates with optimal installation quality.



5 | Pipe Bursting

Pipe bursting technology involves pulling a cone-shaped head with a cable through the defective pipeline. As the head moves through, it breaks the old pipe and pushes the pieces into the surrounding soil. Attached behind the head is a new pipeline of the same or larger bore diameter.

Experts Float New Solution

HOBAS® Pipes for Sewer Rehabilitation in Szczecin, PL

Year of Construction
2004 - 2008

Total Length of Pipeline
2,298 m

Pipe Specifics
D_e 960 - 1434, PN 1, SN 5000 - 20000, NC Profiles

Application
Sewer

Special Features
Easy installation from a floating platform, low weight, little space required during installation, corrosion resistance, pipe cutting possible on site

The HOBAS Experts had to pull out all the stops when renewing a sewer in Szczecin. Lack of space forced the engineers to tackle the problem from a different angle...

Szczecin in Poland not only has one of the largest ports on the Baltic Sea but also old brick sewers and concrete pipelines built in 1904/1905 and the 1930s. Some of the pipes were no longer capable of bearing loads, considerably damaged with cracks, corrosion and infiltration, and in danger of collapsing. The authorities were forced to rehabilitate as quickly as possible and the contractor recommended HOBAS GRP Pipes as the most suitable material for replacing the interceptors.

Work began in December 2004. They installed the pipes from existing manholes or special access shafts, with the various different pipe lengths making the work much easier. In the straight runs, for example, they used 2.25-2.35 m long pipes and 0.5-1.5 m long ones in the curves. Unlike other materials, HOBAS Products can be cut anywhere along their length due to the constant outside diameter and also shortened on the construction site without affecting their excellent chemical and structural properties.

A great challenge during installation was the narrow streets that called for a creative solution on the part of the contractor. What they came up with was a raft that they anchored in the harbor and used as an installation platform. A crane placed the pipes onto the 22 x 8 m floating steel platform and from there they were pulled into the old pipeline using a winch in a shaft located 100 m away from the harbor. To secure the new sections in the sewers and protect them against the groundwater pressure, the pipes were inserted in the old ones, thus preventing distortion and uplift. The annulus between the pipe and new lining was then filled.

The client is convinced that they will not have any problems with the HOBAS Relining Pipes for the next 50 years or more.



Crystal Clear from the Faucet

HOBAS® Relining Pipes Secure Potable Water Supply in Germany

A potable water pipeline DN 1000 made of cast iron caused the Dortmund Energy and Waterworks (DEW) considerable concern. It ran parallel to the B 234 main road and burst pipes were causing pressure loss increasingly frequently. The pipeline was severely damaged in places from corrosion and therefore in urgent need of rehabilitation. Having weighed up the various alternatives – taking such factors into account as legal requirements, costs, disruptions to road traffic and for local residents, construction time and reliability of the new pipeline – DEW opted for HOBAS Relining Pipes.

The contractors dug three pits over a length of 530 m beside and partially along the road's route. In the middle was the entry shaft with the exit shafts at either end. They then inserted the individual pipes into the pit, aligned and joined them. Using a steel cable attached to a ring beam, the pipes were pulled from the entry shaft through the old pipeline to the two exit shafts. HOBAS also supplied fittings and a complete system made of GRP was thus created. In addition, tees with connections for cast iron and steel pipelines, bends and flanges were also used during installation. Finally, the annulus was filled with grout and the pipeline disinfected. A subsequent pressure test confirmed that the HOBAS Pipes were working perfectly.

Given the well-designed HOBAS Pipe Systems, construction progressed very rapidly which pleased the client and meant that the nearby road traffic was hardly affected. As good as new, the potable water pipeline went into operation again after only three days and now reliably supplies the population of Dortmund with clean water.

Year of Construction

2002

Total Length of Pipeline

530 m

Diameter

DN 800

Pressure Class

PN 10

Application

Potable water pipeline

Client

Dortmund Energy and Waterworks

Special Features

Fast installation, excellent flow properties thanks to the smooth inner surface, low weight, long service life



Record Relining with **HOBAS**[®] Pipes

Space-Saving and Fast Installation of Giant Pipes, USA

Evanston, Illinois, a town in the USA north of Chicago, was planning a comprehensive rehabilitation program for all its interceptors, including the replacement of a 2,100 m semi-elliptical concrete sewer pipe in DN 3000. A camera inspecting the pipeline brought the disastrous state of the sewer to light: the concrete had not only cracked in a number of places with lime deposits forming in the cracks, but had also corroded due to the action of the hydrogen sulfide and flowing water. In order to restore hydraulic and structural integrity, the sewer urgently needed to be rehabilitated.

HOBAS Pipes have been in use in the USA for many years and the client also selected slip lining with GRP pipes as the most suitable rehabilitation method for this project. Both economic considerations because of the size of the pipeline and the time factor spoke for HOBAS Products. Relining is usually chosen as the installation method in densely built-up areas and here in particular HOBAS Pipes are ideal, as they do not require any heavy machinery and the construction site can be kept very small.

There was so little space available on site for this project that the pipes had to be stored at a distance of 2.4 km. At the yard there was room for around 600 m of HOBAS Relining Pipes D_e 2900 mm, which were then taken by truck to the installation point as required. The old pipeline was so deteriorated that HOBAS Pipes with a D_e of 2740 mm had to be used for the remainder of the work.

After pipe installation, grouting was also a great challenge, as the local conditions called for a special technology to be used to fill the annular space. To prevent pipe uplift, the grout had to be filled in stages. The contractors also successfully overcame this challenge to the satisfaction of everyone involved. HOBAS Pipes' unique characteristics such as smooth outer surface, high hydraulic capacity and high strength played a key role in the success of the longest HOBAS Relining project to date with this large diameter.

Year of Construction

2008

Total Length of Pipeline

2,100 m

Pressure Class

PN 1

Stiffness Class

SN 5000

Diameter

D_e 2740, D_e 2900

Application

Sewer

Special Features

**Smooth outer surface,
high hydraulic capacity,
high longitudinal stiff-
ness, multiple dia-
meters including many
in-between sizes**



Helping to Clean Up the Baltic Sea

HOBAS® Sewer Pipes Impress in Russia with Long Service Life

Olgino in the St. Petersburg area is a residential district located near the easternmost arm of the Baltic Sea. The bay, also known as the Gulf of Finland, not only has St. Petersburg at its head, but also gives Helsinki and Tallinn direct access to the Baltic Sea. Whenever cities are situated on water, safe and eco-friendly wastewater disposal is top priority. In the case of the Olgino district, the wastewater is first conveyed to a treatment plant and then once treated pumped out to sea.

At the beginning of the 1990s, a concrete pipeline was laid that did not, however, prove capable of withstanding the aggressive water for long. By 2006 the pipeline was so corroded and in danger of bursting that rapid rehabilitation was urgently needed. As HOBAS Pipes with their unique properties have proved their worth many times over in Russia, using HOBAS Relining Pipes for replacing the pipeline quickly and safely was an obvious choice. Over 5 km of DN 1800 liner pipes were slipped into the old sewer and soon the pipeline was as good as new. The excellent hydraulic properties of the pipes' extremely smooth inner surface not only prevent deposits from forming but also ensure that despite the pipeline diameter being reduced from 2,000 to 1,800 mm the hydraulic requirements are fully met. What impressed the client the most was that the pipes were easy to install: low weight, practical push-to-fit couplings and variable pipe lengths speeded up the installation process considerably.

The old concrete pipes were not even capable of withstanding the harsh environmental conditions for two decades. Little wonder that St. Petersburg then looked for a pipe manufacturer with many years' experience and can now rest assured that HOBAS Pipes will do their job reliably for many years to come.



Year of Construction
2006 - 2007
 Total Length of Pipeline
5,100 m
 Pressure Class
PN 1
 Stiffness Class
SN 5000
 Diameter
DN 1800
 Application
Sea Outlet
 Special Features
**Easy installation,
 low weight,
 corrosion resistance**



Amiblu Holding GmbH
Pischeldorfer Strasse 128
9020 Klagenfurt | Austria
T +43.463.48 24 24 | F +43.463.48 21 21
info@amiblu.com | www.amiblu.com

HOBAS is a technology of Amiblu.

Amiblu[®]
Sustainable Water Solutions