

## Quality for Generations

Even if water does not have a market value as such and is not traded on the stock exchange, it is still arguably the most valuable commodity on earth. After all, clean water and a secure supply play a significant role in our quality of life. We at HOBAS therefore use our decades of experience to ensure that potable water gets to you safely and without loss during collection, storage or distribution – so you can enjoy clean water every day.

At the beginning of the 1980s, HOBAS established itself as an international supplier of potable water systems. In 1986, for example, we installed a GRP potable water pipeline for the Hochschwab utility to safeguard the drinking water supply to the city of Vienna. Word got around and other cities in Europe, such as Brno, Prague, Stockholm and Zürich, soon recognized the many benefits of the unique material and opted for HOBAS GRP Pipe Systems. This opened the door to the global potable water market.

Today, HOBAS Pipe Systems are used for potable water systems worldwide and are approved by the water authorities in many countries, e.g. Austria, Croatia, the Czech Republic, Germany, France, Norway, Romania, Spain, Switzerland, Turkey, the United Kingdom and the United States.



## Benefits, Service & Quality

### Benefits of HOBAS Potable Water Pipe Systems

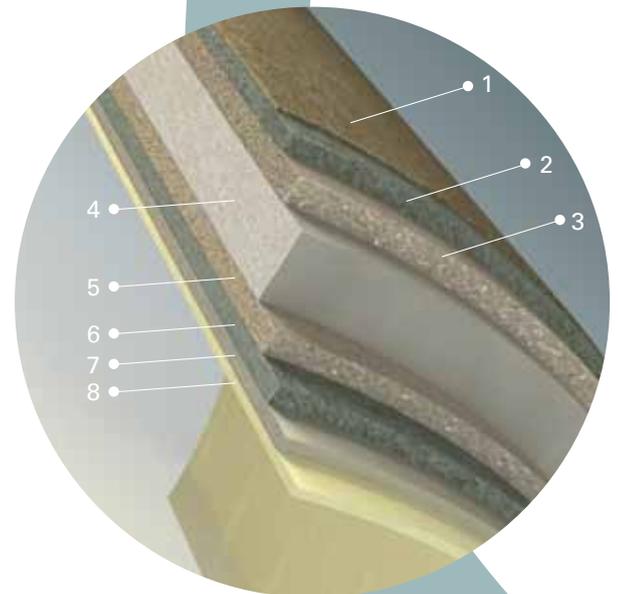
- High corrosion resistance
- Non-conducting material for problem-free installation near e.g. railroad tracks
- Leak-tight system for maximum loss-free flow
- Low weight and simple push-on couplings enable high installation rates even in less accessible and demanding terrain
- Very smooth inner pipe surfaces minimize friction and pressure loss and simplify hygienic measures
- The high dimensional accuracy of the outside diameter ensures a leak-tight system and enables trenchless installations such as pipe relining
- Variable lengths because the pipes can easily be adjusted (shortened) on site
- Curved installation by angular pipe deflection in the couplings
- Consistently high tested and certified quality (material properties and pressure testing)
- Installation possible at extremely high or low temperatures
- Compatibility with other materials
- Service life of more than 50 years

### Our Services

- Support in dimensioning and routing pipelines
- Hydraulic calculations
- Drawing up a verifiable structural design to the relevant national specifications
- Support in dimensioning bedding, anchoring and thrust blocks
- CAD drawings
- Advice and instructions on the construction site



**Centrifugal casting process patented by HOBAS**



#### **Pipe Wall Structure\***

- 1 Protective external layer
- 2 Outer reinforced layer
- 3 Transition layer
- 4 Reinforcing layer
- 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.





### Quality

High demands are placed on all materials that come into contact with potable water. HOBAS supplies flexible, complete systems that our experts at the HOBAS TechCenter regularly and thoroughly test for properties, strength and stressability.

Our products for gravity and pressure applications are available in a wide range of diameters (DN 150 – DN 3600) and various pressure classes (PN 1 – PN 32). These, our management system, and the HOBAS TechCenter have gained an array of national and international certificates and approvals and comply with the standards set by European, American and other international organizations.

They include but are not limited to EN 1796, TÜV Octagon quality mark, ISO 9001, ISO 14001, ISO 17025, and OHSAS 18001.



## HOBAS System Solutions...

For a complete, reliable system suitable from acquiring through storing to distributing potable water we provide a large number of standard and custom products.

### Well and Filter Pipes

Specially manufactured HOBAS GRP Well and Filter Pipes are employed where large amounts of groundwater can be used for obtaining potable water. This involves inserting horizontal or vertical pipes into the water-bearing strata below the groundwater table. The water is then extracted through the gravel filter and a large mesh grid, the filter rods.

HOBAS Filter Pipes have gained an excellent reputation in this application for their outstanding filter rate because of the large filter area, high strength that can be tailored as required, and cost effectiveness in installation and operation.

Particularly where vertical bore wells are very deep, and a long pipe string has to be sunk into the ground to extract the water, the well and filter pipes' high axial tensile strength and the restrained push-on couplings used in such cases play a key role.

**Well pipe**



**Filter pipes**



**Filter pipe  
- inside and outside**



## ...from the Spring to the Consumer

### Spring Water Collection Shafts

Potable water collection from springs is primarily used in mountainous regions, such as the Swiss and Austrian Alps and foothills. Unlike when extracting groundwater, the water does not have to be pumped but flows through filters or filter pipes into the lower lying spring water collection shaft where the sand and fine particles contained in the water are removed by sedimentation. HOBAS naturally produces every shaft exactly to the client's specifications and the practical prefabricated unit design guarantees fast installation.

Spring water collection shaft



Variation of interior design for a spring water collection shaft



### Potable Water Reservoirs

After collection or extraction, spring and groundwater are fed into the potable water supply network and usually initially stored in a reservoir. The drinking water is then distributed from there to the local population as required. Where areas are remote or difficult to access, HOBAS Potable Water Tanks have proved their worth for storing water. With a capacity of five to several hundred cubic meters, our tanks are available in a variety of proven prefabricated designs. This means that every turnkey storage tank is custom built and supplied in system building units with all the extras pre-mounted (e.g. access, valve chamber). It is easy to assemble with the push-on couplings, making your new turnkey potable water tank ready for use within a few hours. Thanks to the low part weights involved, there is no need to use expensive, heavy cranes.

Potable water reservoir



Valve chamber



## Potable Water Pipelines

Water leaves the reservoir in a special potable water line. This is where HOBAS comes in with a wide selection of pipe diameters for various pressure classes. Our FW couplings, which for use in e.g. soft soils are also available in restrained designs (with shear pins), not only result in maximum installation rates but also mean you can rely on a highly loss-free system. The very smooth inner pipe surface with an extremely low roughness coefficient minimizes pressure loss, ensures optimal flow rates and thus helps to save energy in pumped systems.

A wide choice of standard and custom fittings, including tees, flanges, wyes and bends, round off our product range. HOBAS GRP Pipes can even dispense with the need for pipe bends: as the 6-m-long centrifugally cast GRP pipes can be cut and shortened on site without any difficulty and HOBAS FW Couplings enable angular deflection in the joints, curved (polygonal) routes with impressively small radii can be achieved, depending on the pipe length. Small radii have a beneficial effect on the hydraulics, which also reduces pressure loss. In addition, this type of installation eliminates the need for concrete thrust blocks – another bonus that cuts costs.

If curves are not sufficient for bypassing larger structures such as highways and stations or densely populated areas, pipe jacking (see photo on the back cover of the brochure) or other trenchless installation methods such as relining often prove to be the most cost-effective alternative. This is also no problem with HOBAS GRP Potable Water Pipes: Given their smooth outer surface, dimensionally accurate outside diameter and high stiffness, they are highly suitable for these methods.

HOBAS Pipes' UV resistance and low expansion coefficient makes above-ground installation another option for potable water lines.

Whatever installation method and drinking water system you select, it goes without saying that we will provide you with help and advice throughout your project. You can rely on our support and decades of experience in all areas, including dimensioning and routing the pipeline, calculating the required bedding, anchoring and thrust blocks for the pipes, hydraulic calculations, drawing up verifiable structural designs to national specifications, and consultancy services on the construction site.

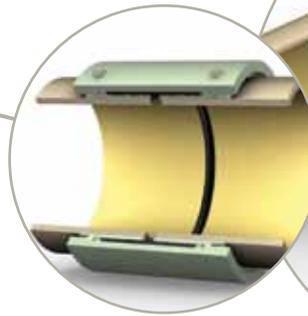
## Pressure Pipe Diameters

Available Diameters DN*						
150	450	750	1100	1535	2160	3600
200	500	800	1200	1600	2200	
250	550	860	1280	1720	2400	
300	600	900	1348	1800	2555	
350	650	960	1400	1940	3000	
400	700	1000	1500	2000	3270	

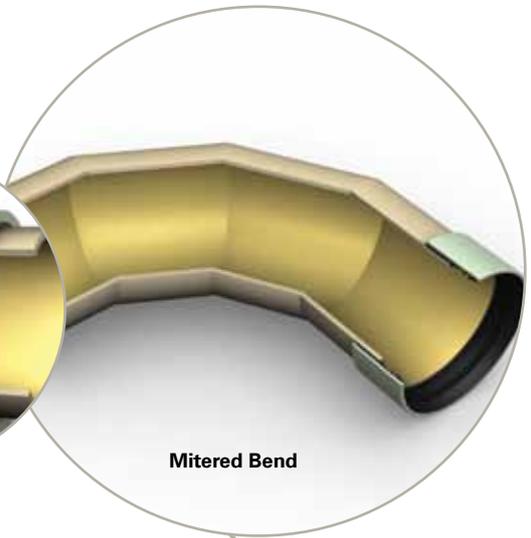
\*Further sizes on request.

HOBAS Potable Water Pipes are produced in 1,2,3 and 6 m lengths (deviations in accordance with factory standards). Other lengths are delivered on request.

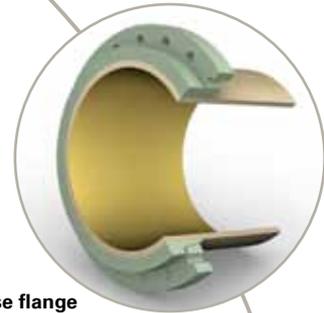
Restrained FW Joint



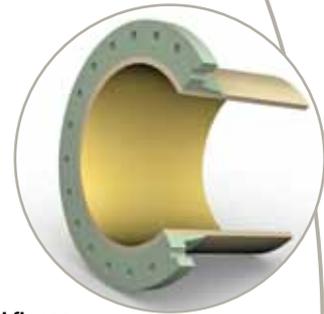
Mitered Bend



Loose flange



Fixed flange



## Turning Old into New – Rehabilitation by Relining

If it is no longer feasible to carry out spot repairs on old pipelines, you are faced with the decision whether to rehabilitate or successively replace all the pipes. As replacing entire pipelines is not only extremely expensive but also causes noise nuisance and disruptions to traffic in urban areas, pipe rehabilitation by means of relining is a much better solution to the problem.

This process generally consists of inserting new pipes into the existing damaged pipeline by pulling, pushing, driving or floating them. Grouting the remaining annulus fixes the inserted pipe in place.

HOBAS Relining Pipes are particularly suitable for this application because of their low weight, smooth walls, corrosion resistance and easy installation. The flush couplings and uniform outside diameter guaranteed by the manufacturing process (centrifugal casting) make it easier to insert the pipes in the pipeline. Comparably thin yet sturdy walls make the best possible use of the existing nominal width. HOBAS Relining Pipes basically create a completely new and structurally fully stable water pipeline.

Another form of relining is the rehabilitation of non-circular gravity pipelines using what is known as egg profiles or arch pipes. Here we have a GRP product line called the HOBAS NC Line. Manufactured using a filament winding process, these special pipe sections are designed to fit the shape of the existing pipeline and thus maintain the maximum flow rate as far as possible.



## Practical Examples



### Project Data

Year of construction

**1991**

Total length of pipeline

**1540 m**

Diameter

**DN 300**

Pressure class

**PN 16**

Installation method

**Open trench**

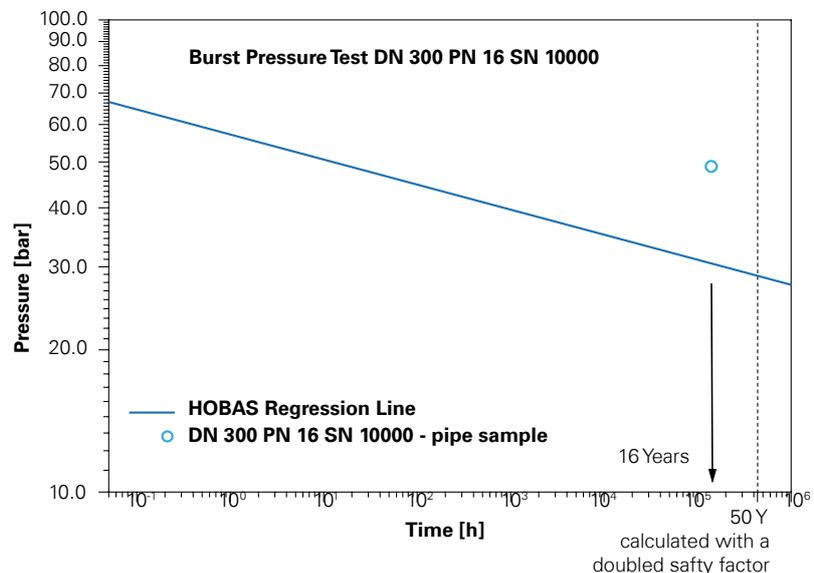
Advantages

**Long service life, excellent hydraulic properties, leak-tight system**

### Crystal Clear from Poland's HOBAS Pipeline since 1991

In 1991, a 1.5-km-long HOBAS GRP Pipeline DN 300 was installed in the center of Wrocław with very little cover in places to subsequently supply drinking water to the Świniary residential district. After nearly two decades of reliable operation, the original route of the PN 16, SN 10,000 potable water line had to be changed, as a new bypass was to be built to ease the traffic congestion in Wrocław. HOBAS Engineers were thus given the rare and extremely welcome opportunity to test pipe segments that had been in use for twenty years. Material tests carried out in-house and externally by the Polish Institute for Engineering of Polymer Materials and Dies (*Instytut Inżynierii Materiałów Polimerowych i Barwników*) showed that all the individual layers in the wall structure were completely intact. The pipe material also did better than expected in the pressure test; the mechanical properties by far exceeded the predicted levels based on the EN 1796 standard.

HOBAS Pipe Systems' numerous benefits have impressed the city of Wrocław many times in the past and the tests on the old pipes now prove that HOBAS Pipe Systems are not only maintenance free but also deliver unbeatable value in long-term use.



Potable water pipes are color coded blue at HOBAS Germany



## Germany Rehabilitates with HOBAS Relining Pipes

Dortmund Energy and Waterworks (DEW) decided to rehabilitate 524 m of a corroded cast steel DN 1000 pipeline in 2002 following several burst pipes and the resultant pressure losses. Having compared the various alternatives in depth, taking such factors into account as the legal requirements and technical specifications for building potable water pipelines, cost and duration of construction, impact on the road traffic, nuisance for the local residents, and restoring the pipeline's reliability with as little effort as possible, DEW opted for HOBAS GRP DN 800, PN 10 Relining Pipes.

The pipes were pulled through the old pipeline on rails from the entry pit using a steel cable winch in the two exit pits. Thanks to the easy handling of the HOBAS Pipes, construction progressed so fast that the contractors only took one and a half days for the two 264-m-long sections.

After the annulus was filled with grout, the pipeline successfully passed the pressure test at 15 bar. Given the HOBAS Relining Pipes' smooth inner surface, the pipeline complied with the hygiene requirements after being flushed only once and went into operation to the client's complete satisfaction.

### Project Data

Year of construction  
**2002**

Total length of pipeline  
**524 m**

Diameter  
**DN 800**

Pressure class  
**PN 10**

Installation method  
**Relining**

Advantages  
**Constant outer diameter,  
easy handling,  
fast installation**





### Curves Instead of Bends in Southern Austria

A 2004 project, Water for Carinthia, was aimed at securing the potable water supply for the 150,000 people living in the southern Austrian towns of Klagenfurt and St. Veit an der Glan. It planned to channel the large water resources to be found near the village of Kappel to the north first to St. Veit and then on to Klagenfurt. A section of the pipeline between the overhead tanks in St. Klementen and Klagenfurt was built using HOBAS GRP Potable Water Pipes. What prompted the decision was the products' excellent corrosion resistance and the option of avoiding bends with curved pipe installation. All that was required was shortening the 6-m-long pipes – the HOBAS FW Push-On Couplings did the rest: They enable angular deflection of the pipes in the joints while remaining absolutely leak tight.

Various local contractors laid up to 100 m a day of the HOBAS Pressure Pipeline in DN 500, PN 10, SN 10,000 using the open-cut method, with the result that the 4.3-km-long section was successfully installed within an impressively short space of time.

#### Project Data

Year of construction  
**2004**

Total length of pipeline  
**4200 m**

Diameter  
**DN 500**

Pressure class  
**PN 10**

Installation method  
**Open trench**

Advantages  
**Saving on bends through angular deflection of the pipes in the joints, pipe length adjustment (shortening) on site is possible**





## HOBAS Potable Water Tank in the Austrian Alps

Situated on a small plateau on the south-facing slopes of Rantenstein, the picturesque village of Pürgg is popular among tourists and climbers alike. To provide the 1,000 inhabitants of this remote resort with enough drinking water, an overhead potable water tank with a capacity of 120 m<sup>3</sup> was installed. Access was difficult with load limits on the road through steep, wooded terrain, which along with the numerous quality and hygiene regulations laid down by Austrian national legislation had to be taken into consideration during product selection. The authorities therefore decided on a HOBAS Potable Water Tank consisting of two parallel water chambers each measuring 2.4 m in diameter with an operating and valve chamber in front. It was above all the short production time, low weight and prefabricated design that convinced the council in view of the project's urgency and the location's challenges.

The tank was installed and ready for operation within six hours. The Municipality Pürgg is extremely satisfied with the high quality products and professional handling of the project by HOBAS.



### Project Data

Year of construction

**2007**

Volume

**120 m<sup>3</sup>**

Diameter

**DN 2400**

Pressure class

**PN 1**

Installation method

**Open trench**

Advantages

**Very short construction time, fast installation, leak-tight turnkey system, structural requirements**

## HOBAS GRP Proving its Worth in the Czech Republic since 1992

When frequent shortages occurred in Brno's potable water supply in the early 1990s, the water utility decided it was time to build a new supply system for the Czech Republic's second largest city – the VOV regional water project. The utility's engineers soon rejected the original plan of using steel pipes, as the network passes under railroad lines in several places and they were worried about corrosion resistance as a result. Internal pressure resistance up to 16 bar, suitable capacity to guarantee an adequate water supply to the surrounding area and compliance with strict hygiene regulations were further requirements that the new pipeline had to meet.

HOBAS won over the engineers with excellent product properties and a comprehensive potable water system. It was not long before a total of

over 20 km of HOBAS GRP Pipes and Fittings in various diameters (DN 300 - DN 1600) were used. The pipes were installed by the open-cut method and partly in a specially built tunnel where the pipeline was mounted on concrete blocks.

The HOBAS Potable Water Pipeline with its many advantages has proved its worth to this day and the city of Brno's satisfaction is reflected in the many projects implemented with HOBAS Pipes that followed.



### Project Data

Year of construction

**from 1992**

Total length of pipeline

**> 20 km**

Diameter

**DN 300 - DN 1600**

Pressure class

**up to PN 16**

Installation method

**Open trench,  
on supports in a tunnel**

Advantages

**Corrosion resistance,  
long lifetime**