

HOBAS[®] Sewer Pipe Systems

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HOBAS[®] Sewer Pipes – Innovative Manufacturing Process

The first industrial application for HOBAS Pipes was as penstocks for hydroelectric power stations in the 1960s. It was not however long before they were also used in the wastewater sector. The reasons are obvious: low weight and practical push-on couplings for easy installation, inner surface as smooth as glass for good flow characteristics and virtually no maintenance, high quality resins for excellent chemical resistance and a service life of up to a hundred years. In other words, HOBAS Pipes are ideal for wastewater systems and have consequently been in use since the 1970s. Time has not stood still and ongoing developments in materials, manufacturing, joining and installation methods have made HOBAS the most universal supplier of pipe systems today.

What has basically remained the same is the centrifugal casting process: standard HOBAS GRP Pipe Systems are made of unsaturated polyester resins, chopped glass fiber and mineral reinforcing agents. The pipe wall is built up step by step from the outside inwards in a rotating mold. 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, void free and have a uniform wall thickness over their entire length.

Thanks to the three-dimensional chemical bonding of the resin as a thermoset, the pipe retains its stability even in very warm environments. One of the benefits of composite material technology is that the products' strength properties can be designed for the specific load directions required. In addition, HOBAS Pipe Systems react to unexpected excessive loads by deflecting; the pipeline therefore reliably remains intact.

Last but not least, the extremely resin-rich inner layer of at least 1 mm guarantees that our products comply with the stringent safety regulations applying to sewer operation and feature a particularly long service life. Where various different materials had to be used in order to meet load, operation and installation requirements, HOBAS supplies a complete system from a single source – nothing but the best for our customers!



Highest Quality, Eco-Friendly

Technical Data

The most important raw materials for HOBAS Pipes are polyester resin, chopped glass fiber and mineral reinforcing agents. Resin envelopes all the components and creates a bond between them.

HOBAS Pipes have the following characteristics, depending on the design:

Physical Properties					
Density	~ 1.7 - 2.2 g/cm ³				
Linear expansion	~ 2 - 3 x 10⁻⁵ 1/K				
Thermal conductivity	~ 0.19 - 0.25				
Elastic modulus	~ 7000 - 15000 N/mm²				
Specific volume resistance	~ > 10 ¹³ Ω/cm				
Surface resistance	~ > 10 ¹² Ω				

Top Quality

Certified by independent institutes to various international standards, the HOBAS Plants ensure that the finished products meet the highest customer specifications. Compliance with ISO 9001 as well as uniformly high quality standards are key features of HOBAS Products and firmly rooted in the corporate philosophy. Continuous quality control from incoming raw materials through finished products is carried out by our experts and monitored by external testing agencies.

Our comprehensive quality control program meets international standards and 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 – without any ifs or buts.

Dedicated to Environmental Protection

The environmental management system in place at HOBAS Organizations conforms to the strict requirements of the ISO 14001 standard. We see the continuous improvement of our environmental protection measures as part of our corporate social responsibility and the HOBAS Group has therefore set itself the goal of improving our eco-balance year by 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 any impact on the environment.

Our strong commitment to conservation can be seen throughout the entire product life cycle. In the production process, pipe transport, installation, operation, and above all in the lives of HOBAS Employees, we ensure that we not only do the bare minimum required but also take every opportunity we can to protect the environment.

Pipe Wall Structure

- External protective layer
 Outer reinforced layer
- (glass fiber, polyester resin)
- 3 Transition layer (glass fiber, polyester resin, sand)
- 4 Reinforcing layer (sand, polyester resin, glass fiber)5 Transition layer
- 5 fransition layer
- 6 Inner reinforced layer7 Barrier layer
- 8 Inner pure resin layer

HOBAS® Sewer Pipe Systems - Highly Resistant

Resistance and durability are probably the most important demands placed on sewer pipes. Selecting a suitable pipe material is therefore essential, above all to prevent corrosion damage on the pipeline. What also has to be taken into consideration is that the pipeline's service conditions can change substantially throughout its life. Demographic changes, fluctuating water consumption or alterations in people's habits are just some of the aspects that can have an impact on the sewage composition.

A particular danger in wastewater systems is biogenic sulfuric acid corrosion. It is caused by bacteria converting sulfates in the sewage into sulfuric acid with a very low pH-value, which attacks concrete and steel. Made of CC-GRP, HOBAS Sewer Pipes have a very high resistance to acids in sewage. To enable us to provide our customers with the best possible quality, the experts at the HOBAS Laboratories carry out a range of long-term tests including strain corrosion testing. It involves subjecting the pipe to a combined, extreme load consisting of external forces and sulfuric acid. Inadmissible structural loads are therefore simulated while the surface is exposed to concentrated sulfuric acid at the same time. HOBAS Pipes achieve excellent results on this internationally standardized test with an outer fiber strain of 1.1 % (50-year figure). Our customers can therefore trust in higher long-term safety factors for the typical loads experienced in sewer operation than with other materials.



Above: Pipe undergoing strain corrosion testing

Left:

HOBAS Pipes achieve excellent maximum fiber strain results of 1.1 % in strain corrosion testing

Properties and Benefits

- Design drawing on decades of experience in pipe manufacture and installation
- Perfect dimensional accuracy
- Variable pipe lengths (to customer specifications)
- Low weight and practical push-on couplings for high installation rates
- High abrasion resistance (inside and outside)
- Very smooth inner and outer surfaces (k \leq 0.016 mm)
- Low-absorption on outer surface
- High stiffness classes available
- Angular deflection possible in couplings
- Very long service life of up to 100 years
- Installation possible irrespective of weather conditions
- Complete pipe system including manholes and fittings
- Simple cutting, also on site
- Leak-tight pipe wall and joint
- Little incrustation and sludge deposits
- Not sensitive to frost and high temperatures
- UV resistance
- Corrosion resistance
- High structural load capacity

Installation Methods

In whatever way you are planning to construct your pipeline, HOBAS Products are definitely the right choice and deliver convincing results for every conceivable installation method:

- Open-cut installation
- Trenchless installation by jacking
- Trenchless pipe rehabilitation by relining
- Above ground installation on bedding
- Above ground installation suspended under bridges
- Installation in tunnels
- Sea outlets



HOBAS® System Solutions - Your Complete Package

Pipe Diameter - from Tiny to Titanic

HOBAS Sewer Pipes can be supplied in the following sizes:

Available diameter DN*							
150	400	650	900	1250	1700	2200	
200	450	700	950	1350	1800	2400	
250	500	750	1000	1400	1900	2500	
300	550	800	1100	1500	2000	3000	
350	600	850	1200	1600	2100		

* Other sizes on request.

HOBAS Sewer 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.

HOBAS Couplings - and Pipes Stay Sealed!

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FWC Couplings are used as the standard means of joining HOBAS Sewer Pipes. This coupling model is made of glass fiber reinforced polyester resin with an integral full width EPDM membrane. It means that the couplings mounted on one end of the pipe at the factory are verifiably leak proof and the pipes only have to be pushed together on the construction site. The well-designed HOBAS FWC Couplings enable higher installation rates and are also used as standard for the various HOBAS Pressure Pipes.

The **PN 1 - PN 10 assembly coupling** consists of a stainless steel body with a screw connection and an EPDM seal.

Supplementary **HOBAS®** Products



Bends



Tees



Pipe Junctions



Saddle Junctions



Masonry Connections



Flanges



Tapers



Manholes



Tangential Shafts

Totally Satisfied for over 25 Years

HOBAS® Sewer Pipes Impress Testing Company, AT

The sewer authority in the district of Gleisdorf (eastern Styria, Austria) put a combined sewer out to tender in 1979. What was planned was a rectangular channel with a gradient of 2 ‰ and a depth of up to 4 m as well as an egg-shaped section with a gradient of 1 ‰ and a depth of up to 4.2 m. Fortunately, the building contractor thought outside the box and submitted an alternative quotation with HOBAS GRP Sewer Pipes in DN 1200 and DN 1600. Although pipes made of glass reinforced plastic were not very well known at that time, the benefits of HOBAS Products convinced the client and the project was implemented with HOBAS Sewer Pipe Systems.

Time passed and over 25 years later an authorized and accredited testing company set about inspecting the sewer system. Primarily testing for leak tightness, they found no fault with the HOBAS Pipe Systems: "The positive test results – all the lines are leak-tight – show that we made the right decision", says engineer Scharnagl, general manager of the Gleisdorf basin sewer authority, in a testimonial. As no problems whatsoever occurred in service with what was then a little known pipe material, the sewer authority installed many more kilometers of HOBAS GRP Pipes in the years that followed. "And everything to the sewer authority's total satisfaction", adds Scharnagl delighted with the excellent quality of the HOBAS Sewer Pipes.

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Year of Construction 1979 Total Length of Pipe 935 m Diameter DN 1200 and DN 1600 Pressure Class PN 1

Stiffness Class SN 5000 Application Sewer Special Features Long service life; problem-free, quick installation; the lines are leak-tight after over 25 years in use

HOBAS[®] Guaranties a Safe Landing

Use of **HOBAS®** Sewer Pipe Systems at Airports

Construction work at airports is subject to stringent safety regulations, which always poses great challenges. Firstly, the work must not interfere with the air traffic, and secondly, pipelines at airports are exposed to extreme dynamic loads. In addition, when planning a pipeline system at an airport and selecting the material, the fact that kerosene and special deicers can contaminate the area where the aircraft are refueled and prepared for takeoff also has to be taken into consideration. HOBAS GRP Pipes feature particularly good hydraulic properties, corrosion resistance and can easily withstand aircraft loads, increasingly giving them the edge over competitive products.

In Germany, for example, the new Berlin-Schönefeld airport will replace Tegel and Tempelhof within the city boundaries. It will cover a total area of 1,470 ha, the equivalent of 2,000 football pitches, and use HOBAS Pipes in DN 600 through DN 1600 for pressure drainage. Close cooperation for all the work from drawing the installation plans, supporting the fitters on site during installation through carrying out the pressure testing, and smooth coordination of the logistics ensures that construction runs on time.

Schiphol Airport in Amsterdam, the Netherlands, has been trusting in the excellent properties of HOBAS Products since 2003. It was then that the sewer pipes installed under the runways and other paved areas in the 1960s were found to be damaged. Above all, the great weight of the Boeing 747 had taken its toll on the old reinforced concrete pipes and the next aircraft generation with the Airbus 380 was due for rollout. Rehabilitation involved replacing the pipelines under the runways, taxiways and ramps with SN 16000 pipes developed specially in cooperation with Schiphol Airport.

Many other projects, such as the international US airports in Los Angeles and Dallas, in Prague, Sarajevo, Frankfurt and other German cities impressively testify to the fact that HOBAS has become established in recent years as a reliable airport partner.

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Berlin Airport

Year of Construction 2008 Total Length of Pipe 8 km Diameter DN 600 - 1600 Pressure Class PN 6 - 10 Stiffness Class SN 10000

Application Sanitary and storm sewer Special Features Excellent hydraulic and structural properties; engineering solutions; professional technical service

Amsterdam Airport

Year of Construction 2009 Total Length of Pipe 7.3 km Diameter DN 300 - 1600 Pressure Class PN 1 Stiffness Class SN 16000 Application Sewer Special Features Quick, easy and also trenchless installation; long service life; inner surface as smooth as glass; professional support from the HOBAS Benelux Team

Restoration for the River Rawa

HOBAS® Sewer Pipes Direct Polluted River to a Wastewater Treatment Plant in Chorzów, PL

Once upon a time there was a little river that wound its way through the scenic countryside in southern Poland. In the course of time however more and more wastewater was discharged into it until the small river turned into an open sewer, posing a considerable threat to the environment. Only ten percent of its water came from the source and 90 percent consisted of storm water and wastewater. It was time to act!

Because of the high level of pollution and resultant unpleasant odor, the Rawa was routed through underground channels in the 1970s and 1980s. In 2008 the authorities finally started restoring the river. The core idea of the project was to pipe the water, convey it to the wastewater plant, treat and return it to the river.

First the client and the planning office compared the various alternatives in depth. They initially contemplated using concrete, but soon rejected the idea. The soft soil could have led to subsidence and subsequently structural damage, which would have required additional shoring making the concrete solution too expensive. The choice finally boiled down to polyethylene (PE) and glass reinforced plastic (GRP). Comparing the investment involved, the HOBAS GRP option proved to have considerable advantages, especially thanks to the easier installation. Also in view of the subsequent operating conditions, HOBAS definitely had the edge. Given that most of the sewer was only to have little cover, it would have to withstand great differences in temperature and other loads. GRP as a thermoset displays far superior properties in relation to structural load capacity under the influence of temperature and thermal expansion than PE.

Having taken the technical and economic advantages into account, the client awarded HOBAS the contract to supply the pipes for this challenging project. Before installation, the contractor stripped the top soil up to a meter under the pipe bed, removed the earth contaminated by the polluted water and replaced it with new material. The Rawa now flows through the HOBAS Pipes to the treatment plant and the unpleasant odor in the surrounding area is a thing of the past. At the wastewater plant, the water is treated before being returned to the natural river bed - and the local residents are delighted to have a recreational area with a clean river.

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Year of

Construction 2008-2009

Total Length of Pipe 6.1 km **Pipe Specifics** DN 1800 - 2400, PN 1, SN 5000 Installation Method Open cut Application **Channeling a river Special Features** Quick and easy installation; temperature resistance; little space required for installation; excellent hydraulic properties



HOBAS

Preferred for Wastewater Treatment Plants

HOBAS[®] Pipe Systems: A Material for Any Challenge

Treatment plants form the core of every wastewater disposal system. The wastewater is collected in sewers and conveyed to the plants where it is treated in several stages. Inside a sewage plant, the pipelines have to meet various demands. In the past, different materials were used, depending on whether the pipes were for intake lines, lines between treatment basins, sludge dewatering lines, air lines, etc. HOBAS GRP Pipes can reliably meet all these diverse requirements, making them the frequent and ready choice for use in wastewater treatment plants for many decades.

It is not just its functionality and diversity that make the HOBAS Pipeline System a particularly suitable material for wastewater treatment plants, but also its benefits in planning and installation that positively eclipse alternative materials. Hardly any other material can meet so many requirements at the same time: The pipes are ideal for use as sewer and pressure pipelines for wastewater, sludge dewatering, pressure aeration and many other areas. The HOBAS Fitting range, including manholes, provides complete system solutions. Custom-made fittings are also manufactured simply and flexibly in all shapes and sizes (e.g. culverts, various reducers for large diameters, etc.).

In the wastewater treatment plant sector, HOBAS has extensive experience enabling our experts to support both the planning office and the construction company. As a result, even highly challenging projects can be implemented quickly and easily with custom-made products. In such cases the contractor only has to join the pipes with push-on couplings - a great advantage over welded structures where the weather conditions play a role. It is therefore not without reason that HOBAS Pipes are used frequently and readily, proving their outstanding quality in a large number of wastewater treatment plants in various countries around the world.

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Use Since the 1970s Diameter DN 150 - 3000 Locations Around the world Application Pipelines for sewage plants Special Features Various applications - one material, quick and easy installation, HOBAS Experts provide professional advice on all aspects of the project, complete range of fittings



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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