Amiblu®
Sustainable Water Solutions

HOBAS®

HOBAS®
NC Line
Non-Circular Profiles

Production of **HOBAS®** NC Line

Years of Experience

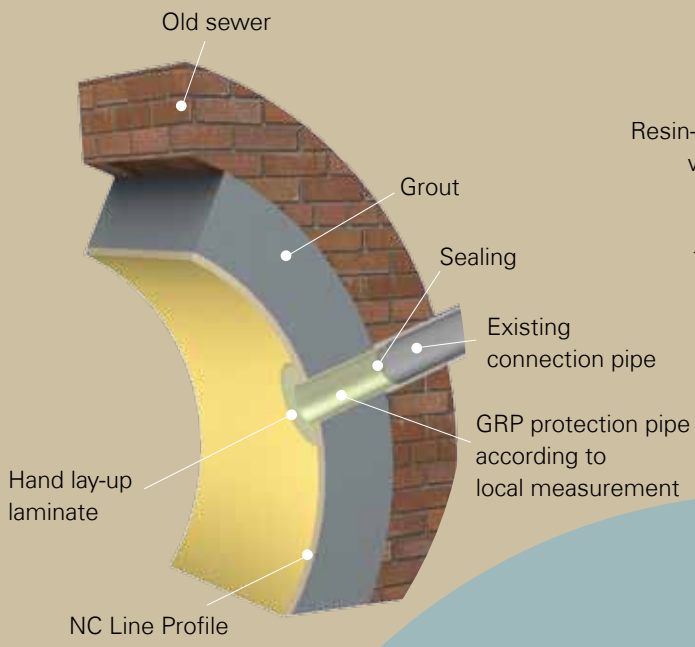
Many European cities started building modern sewer systems in the middle of the 19th century. Still in service today, the large sewers with specially shaped cross sections are the result of great feats of engineering and the foresight shown by the city fathers at that time. After such long periods in use, however, renovation often becomes inevitable despite regular maintenance. HOBAS NC Line Profiles with their non-circular cross sections are ideal for rehabilitating these old sewers and building new ones. Manhole renovation solutions and relining pipes round off the HOBAS Rehabilitation range.

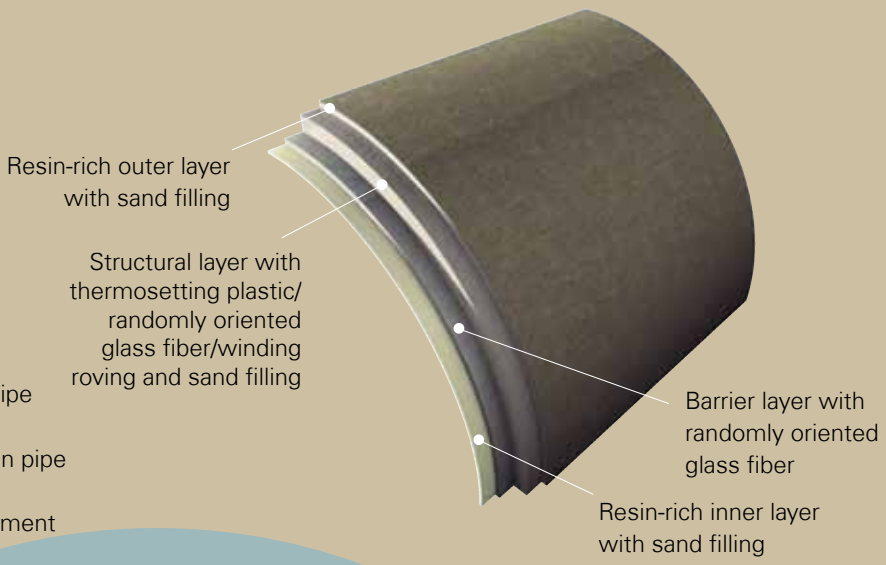
Manufacture

HOBAS NC Products feature a particularly resin-rich inner layer. First this layer is applied to a release film and then the filament winding process begins. Pipes can be designed for specific loads and project requirements, while also taking structural dimensions, customer specifications and regulations regarding chemical resistance into account. Once the winding process is completed, the pipe undergoes finishing and is then removed from the mandrel. Depending on the size and wall thickness, the completed pipe is tempered for several hours to ensure that the polyester resin is fully cured.

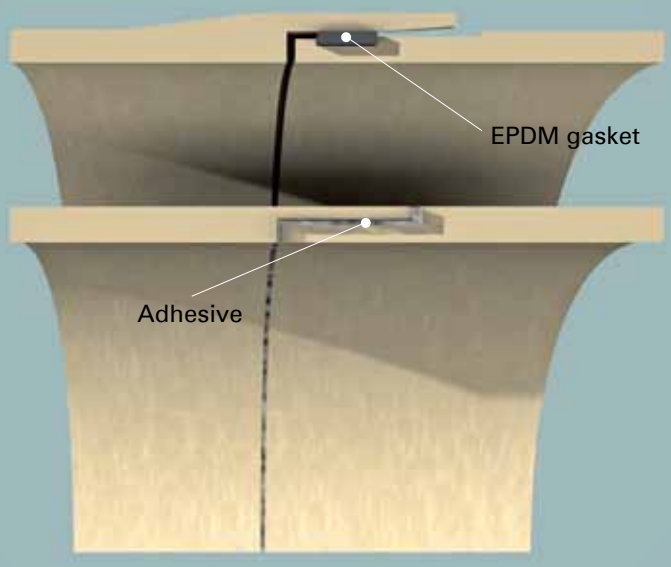
During installation, the pipes are pushed or pulled into the existing pipeline and the remaining annular space between the host and liner pipes is filled with pressure-resistant grouting, usually a mixture of binding materials. This fixes the inserted pipe in position, creating a pipeline of the very same integrity as an entirely new one.

Joints and Couplings





Type I kit:
Standard joint with EPDM gasket



Type II kit:
Adhesive joint for special applications

Kite-shaped cross section

Egg-shaped cross section

Elongated egg-shaped cross section

Jaw-shaped cross section

Jaw-shaped cross section with dry weather channel

HOBAS® NC Line Profiles

The range of available HOBAS NC Line cross sections is just as varied as the history of wastewater disposal itself.

In addition to classic cross sections, such as circular, egg, jaw, or kite-shaped pipes, we manufacture more and more combinations of shapes to customer request. Having perfected the necessary manufacturing technologies, HOBAS is regarded as a specialist for solving complex rehabilitation problems.

Such expertise naturally includes a suitable jointing technology. HOBAS Experts are happy to assist you in finding the perfect choice for your project.

Shafts and tangential manholes are also featured in our range of products. We can therefore supply customers with a complete system including pipes with special cross sections, lateral connections and manholes.

HOBAS® NC Line Applications

HOBAS NC Line Profiles not only help you overcome a wide range of challenges in rehabilitation but also in building new supply and disposal systems. The material properties and cross-sectional shape are determined for each specific application. Particularly when other materials have reached the end of their life cycle or failed prematurely, our pipe sections are a long-lasting option.

NC Line Products are ideal for conveying
- Municipal sewage
- Industrial wastewater
- Raw water
- Chemically aggressive wastewater

The special material properties, shapes and jointing options result in the following advantages:
- Good hydraulic performance under various loads
- Flexibility in difficult installation situations
- Self-cleaning properties when flow is low
- Low maintenance costs
- Connection options to various materials
- High static load capacity
- Short installation times
- Long service life

Optimal Service and Top Quality Standards

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 around with a broad range of products and professional support.

This includes:

- Technical advice for planning, installation, and rehabilitation
- Feasibility studies
- Static calculations to various regulations
- Design and drawings for manholes and special constructions in 2D and 3D
- Consultancy, training, and support for contractors
- Installation services
- Technical documentation and information
- On-site support during construction work by HOBAS Technicians

Top Quality

HOBAS Plants are certified by independent institutes to various international standards, making sure that each finished product meets the most stringent customer specifications. The HOBAS Group also follows the international standard OHSAS 18001 (Occupational Health and Safety Assessment Series). This standard presents a comprehensive system for planning, implementing and controlling the required measures for occupational health and safety according to legal specifications. It further aims to reduce accident risks at work in the long run. In combination with ISO 14001 and 9001, OHSAS 18001 provides HOBAS with an effective and uniform management system in the areas of safety, environment and quality.

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 bodies 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 raw materials
- Testing semi-finished products
- Testing services
- Technical release for production
- Strength tests on finished products
- Visual and dimensional inspection of finished products
- Hydrostatic and hydrodynamic tests
- Calibration of instruments
- Ensuring the identification and traceability of the products
- Checking planning processes and design
- Checking suppliers

HOBAS® NC Line: Impressive Benefits

HOBAS NC Line Products feature:

- Full static load capacity
- Variable pipe lengths (to customer specifications)
- Customed cross-section shape
- Option of various jointing systems
- High hydraulic capacity
- High corrosion resistance
- Tested abrasion resistance
- Easy handling
- Installation without significant traffic disruptions
- Installation irrespective of weather conditions
- Compatible with all HOBAS Product Lines
- Little incrustation and sludge deposits
- Minimized trench width, therefore easier for working in confined spaces (e.g. city centers)
- Environmental benefits – towns and landscapes are not affected by construction work
- Prevention of drops in groundwater level
- Very long service life of more than 50 years

Unnoticed Under Historic Dresden

HOBAS® NC Line Profiles Rehabilitate Sewer, DE

Year of Construction
2009
Total Length of Pipeline
HOBAS Pipe: 880 m
Pressure Class
PN 1
Diameter
2157/2129,
2242/2195 mm
Installation Method
Relining with short profiles
Client
Stadtentwässerung Dresden GmbH
Advantages
Pipe cross-sections designed to fit the old sewer, no disruption of tourism/traffic, reliable deliveries

At the beginning of the 20th century Dresden's sewer system was already 430 kilometers long. An essential part of the sewer system with connection to the wastewater treatment plant Kaditz is to this date the "Altstädter" collector, which underpasses a big part of Dresden's historic center.

One of the interceptors in the old town was made of tamped concrete. Inspections revealed damage meaning that their load capacity could no longer be guaranteed: the sewers urgently needed to be repaired. Over 1.3 km in length, the section to be rehabilitated ran through the old town and along the banks of the Elbe. As an attractive destination, Dresden draws some 7 million visitors every year. In view of this situation, the only option was trenchless rehabilitation by relining. Compared with open-cut installation, construction time would be speeded up and disruptions to traffic and tourism reduced to a minimum.

Dresden's utility company weighed up the various alternatives but decided in favor of HOBAS NC Line Profiles made of GRP. Thanks to the smooth inner surface of the HOBAS Special Pipe Sections with a k value of ≤ 0.01 mm, the hydraulic requirements were still met despite the reduction in diameter. The first step was to assess the condition of the existing pipes by inspecting the old sewer, calibrating it by laser scan and manually with a template in places to determine the exact outside dimensions for the individual NC profiles. Our aim was to make best possible use of the old sewer while ensuring easy installation at the same time. What we came up with was an installation plan with regular, short and special pipe sections with bevel joints. In areas with particularly pronounced angular deflection the prefabricated curved parts were joined using GRP hand lay-up. The prefabricated HOBAS NC Profiles can be produced with any wall thicknesses required, thus compensating for any structural imperfections in the old sewer.

Opting for two construction stages, we installed a total of 520 m HOBAS NC Profiles with an inner cross-section of 2,157 x 2,129 mm and 320 m with 2,242 x 2,195 mm. After completion, the interceptor was totally rehabilitated and will reliably operate for at least fifty years even in the event of flooding. The many tourists hardly noticed what was going on, with the only evidence being the pipes stored nearby and the few access shafts fleading to the works under the streets of Dresden's old town.

No Dig Award for Relining with **HOBAS®** NC Line

HOBAS® NC Line Sections Replace Sewer System in Tilburg, NL

The sewer in Sint Josephstraat was built in 1928 and has the shape of an upside-down egg 1.90 m wide and 2.15 m high. In the late 1990s, work on the road above put a considerable strain on the the concrete sewer base with brick arch. Inspections with radar systems revealed that cavities had formed around it because cracks in the sewer had caused sand to be washed out. As injecting resin into the cracks did not prove as successful as ex, rehabilitation was inevitable.

Analyses showed that the sewer's masonry was actually intact, but the concrete sewer base had suffered greatly in recent years. Attempts at repairing the base failed because the structural damage could not be rectified. In order to guarantee structural safety as well, the only answer was to rehabilitate the old sewer or install a new one. A total replacement would have involved extensive construction work in open trenches and would have been very expensive, and so relining was the only feasible option. What was important to the local authorities was to reduce the diameter bas little as possible (maximally 10 cm). Angular deformation on the horizontal plane along the route of the pipeline where rehabilitation was required also had to be taken into account.

Tilburg city council opted for HOBAS NC Line Products to reline the pipeline. Decisive reasons were the high standards of HOBAS Products, the company's experience regarding installation, the tested, consistent material quality, high stiffness and adaptability, enabling only a slight reduction in diameter. In addition, the sewer can remain in service during installation even if there is heavy rainfall. The tender also specified various fittings (manholes, pipe inlets, etc.) which HOBAS customized for the project.

After calculating the wall thickness of the pipe segments to be 26 mm, the client designed a special transport cart for installing the pipeline. During the construction work the wastewater was diverted. In the event of heavy rainfall, the existing sewer could however be evacuated within 15 minutes and then be used. The pipes were fixed in place to prevent them from floating and the annulus between the new and existing pipeline filled with grouting.

A panel of experts selected the project for the NSTT (Netherlands Society for Trenchless Technology) No Dig Award in 2009 and the client was more than satisfied – the decision to use HOBAS NC Line Profiles again for the next rehabilitation section is perfect proof of it.

Year of Construction
2008
Construction Time
5 months
Total Length of Pipeline
860 m
Pressure Class
PN 1
Diameter
2150/1900 mm
Installation Method
Relining
Client
Community Tilburg
Contractor
Heijmans Infra techniek BV
Advantages
Custom pipes, leak tightness of the system, high quality, only slight diameter reduction

The Best Solution for Basel-Stadt

HOBAS® NC Line System for Relief Sewer, CH

After 70 years of service, the approximately 1-km-long egg-profile concrete relief sewer in the Swiss canton Basel-Stadt Switzerland could be no longer maintained. Due to the remaining load-bearing capacity of the old structure and the varying geologic conditions, three renovation options were considered: re-profiling mortar, GRP lining and an inside shell of self-compacting concrete (SCC). After weighing up all aspects, the evaluation spoke clearly in favor of relining with HOBAS NC Line Systems.

As only solution that could reliably reinforce the old and porous sewer structure in the future, the GRP lining with HOBAS NC Line Profiles aced out its alternatives in terms of structural safety. The significantly lower roughness coefficient of the inner pipe layer and relatively thin wall thickness of 24 mm of the HOBAS NC Line Profiles provided the highest stability and sturdiness as well as the greatest discharge capacity compared to the alternatives. The prefabricated 1300x1870 mm NC profiles were designed to match the original channel's form and comprise a dry weather channel as well as a lateral walkway with a safety tread for inspections.

Three access shafts were prepared to slipline the HOBAS NC Line Profiles which are delivered in 0.5, 1 and 2 m-lengths to optimally adapt to the pipeline route. The easy handling of the profiles is particularly important regarding the restricted accessibility to the channel and depth (15 to 18 m) of the route. Just-in-time deliveries and a fast installation reduce impacts on the environment, traffic impairments and disturbance of the inhabitants. Despite the necessary drainage of the old structure during construction works and preparation of shafts, the estimated installation period for sliplining HOBAS NC Line Systems is the shortest of all compared solutions. Thanks to the products' longevity of a minimum of 50 years and minimal cleaning efforts due to the smooth finish of the internal pipe walls HOBAS GRP also clearly scored in respect to low maintenance costs. And unlike other proposed materials, costs will not rise with the line's age.

Year of Construction
2011 - 2012
Total Length of Pipeline
1000 m
Product Range
0.5, 1 and 2-m-long sections with dry weather channel and walkway
Diameter
ca. 1300x1870 mm, wall thickness 24 mm
Pressure Class
PN 1

Installation Method
Relining
Client
Tiefbauamt Stadtentwässerung Basel-Stadt
Contractor
Insituform Rohrsanierungstechniken GmbH
Advantages
Highest structural safety, long product life, low maintenance costs, fast installation for less impacts

HOBAS® NC Line Conquers North America

Replacement of Stormwater Pipeline in Québec, CA

When the old stormwater sewer crossing a highway and a highly frequented shopping avenue in the city of Québec partly collapsed and had to be replaced, the city government was presented with quite a challenge: A way had to be found to renovate the pipeline while keeping traffic interruptions to an absolute minimum. The single best way to cope with this issue was trenchless installation. Moreover, the new pipeline should be durable and low-maintenance in order to prevent further works in this sensitive area.

The name of the solution that made the grade was HOBAS – the only pipe supplier in Québec able to provide a custom-tailored product with the required properties and an arch cross-section available in various lengths. HOBAS was awarded the contract and 220 m NC Line profiles with a cross-section of 1557 x 790 mm were sent from Germany to Eastern Canada. With minimal excavations and no traffic disruptions, the old corrugated steel sewer was successfully replaced with GRP within merely five weeks.

The client is very satisfied with his choice and especially the project's good environmental balance, which also received an official hearing: The Québec association for road building and heavy construction (ACRGTQ) awarded the rehabilitation job best environmental project of the year. The way is now paved for further HOBAS Projects on North American soil.

Year of Construction
2013
Diameter
1557/790 mm
Stiffness Class
SN 10000
Application
Rehabilitation of storm water sewer
Client
City of Québec
Designer
SNC Lavalin
Contractors
Excavation Lafontaine, 2C2T
Advantages
Corrosion resistance, high static load capacity, long lifetime of more than 50 years

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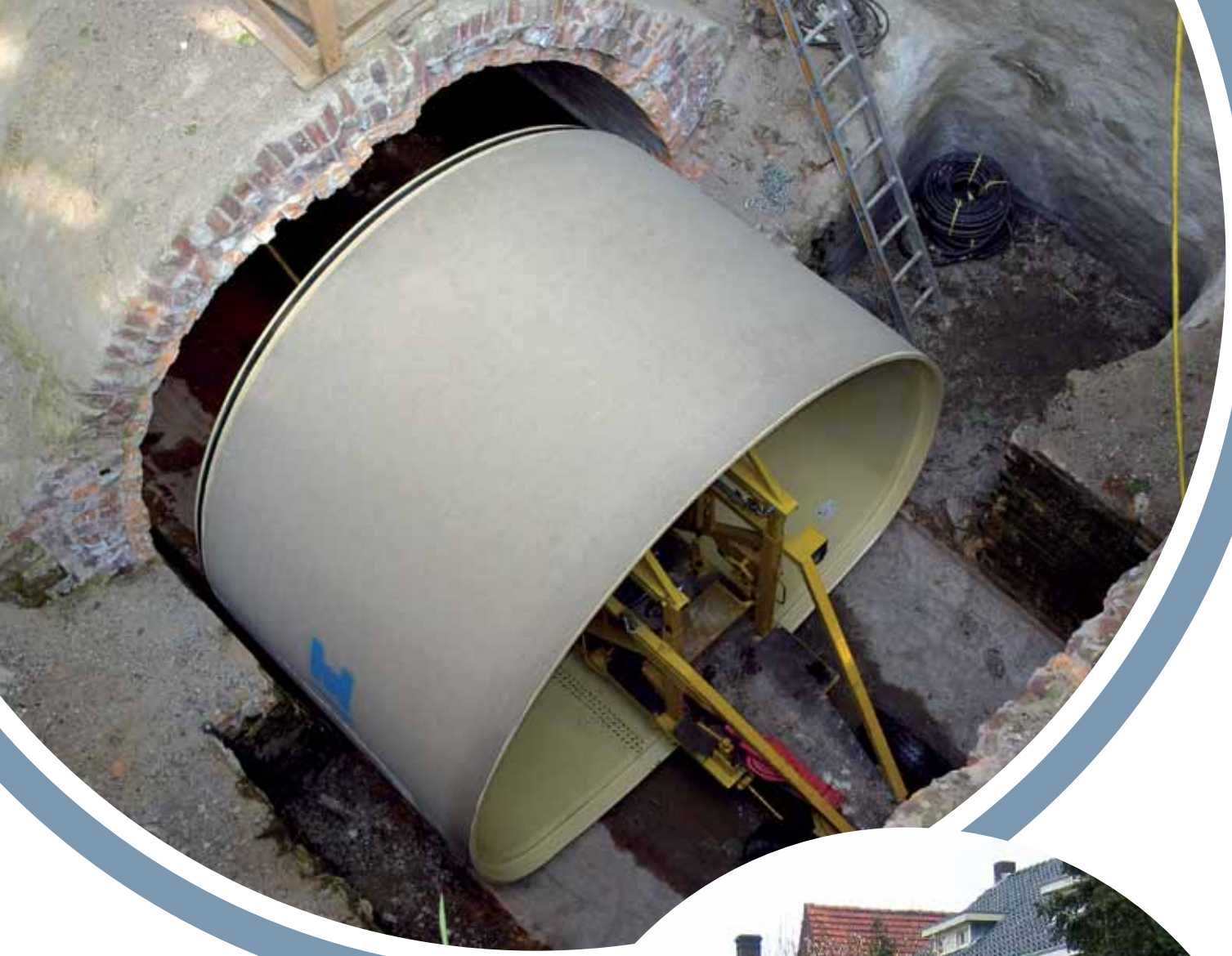

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HOBAS is a technology of Amiblu.

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