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# Amiblu<sup>®</sup> Stream

Sustainable sewer rehab with Amiblu NC Line

Expert interview Costin Berbecaru Brochures & product data

Amiblu NC Line pipes for the renovation of an aged sewer in Essen, Germany. Read more about the project on pages 8/9 .

## **Amiblu** Stream



## Message from the CEO

You have certainly been there: Summer holidays just started, you're in the car excited to get going – and then there's this construction site mid-town that blocks everything. Traffic jam, madly honking and gesturing drivers, air conditionings running at full blast. Why on earth do they have to do this work <u>now</u>? Well, of course we all know that the reason is simply a matter of need. Aged pipelines, for example, need to be replaced or renovated before it's too late (once they break, slow traffic is the least problem). The good news is: We have ways to turn an old pipeline into a new one with you hardly noticing.

Relining of Amiblu NC Line pipes usually requires only two (sometimes even just one) installation pit(s) through which the pipes are lowered to be then pushed or pulled into the old channel, joined with leakproof couplings, and "blended" with the old structure with liquid mortar. Thanks to the pipes' light weight and the trenchless approach, disturbances of everyday life are kept to an absolute minimum and this not only saves time and annoyances but also the environment – running car engines and heavy construction machinery produce tons of toxic  $CO_2$ . And our GRP pipes' 150 years service life mean that you'll see them only before and during installation, and then never again.

This edition of Amiblu Stream covers several fascinating rehabiliation projects with Amiblu NC Line and also circular Hobas and Flowtite pipes all around the world. Costin Berbecaru, Amiblu Sales Director for South-East Europe, further provides you with insights into a comprehensive recent project in Bucharest. Enjoy reading this Amiblu Stream and have a great summer clear of traffic jams!

Best wishes from Klagenfurt, Pierre Sommereijns

## Dąbrowa Górnicza: Fresh female power in fittings production



Smiling faces, great skills, high motivation: Our new female team in GRP fittings production of Amiblu Poland South (Dąbrowa Górnicza) is just the perfect support! Six women started their careers in May 2019 at Dąbrowa Górnicza, following a targeted initiative of the Amiblu HR Team lead by HR manager Sylwia Góralczyk.

After the first workweeks, the new employees gave very positive feedback concerning the atmosphere, working conditions, and support received locally. Amiblu HR aims to recruit more female production staff members in the future, also for the factory in Gdańsk (Poland North). Once again, a very warm welcome to all of you!



## Customized and leakproof: NC profiles reline blackwater sewer

In the north-Italian city of Piacenza, three different non-circular GRP pipe profiles by Amiblu (one egg profile, two mouth profiles) have been used for rehabilitating a number of old sewer channels with a total length of 589 m. The hydraulic and structural properties of the existing pipelines were no longer sufficient. The new NC pipes were inserted into the old channels with a push system, meaning that the pipes are pushed from a starting pit to an arrival point which at the same time marks the end of the pipeline to be renovated.

The remaining annular space was filled with a special grout, resulting in a structurally sound new sewer with perfect hydraulics and leak-tightness. After no more than three months, the installation was completed to the full satisfaction of the client.

PROJECT PARAMETERS		
Country / City	Italy / Piacenza	
Year of construction	2018	
Installation time	2.5 months	
Application	Blackwater sewer	
Installation	Relining	
Technology	Amiblu NC Line	
Total length of pipe	589 m	
Pipe diameter	870/1325 mm (61 m) 1310/1895 mm (138 m) 1500/2290 mm (390 m)	
Client	IREN-Ireti	
Contractor	Euroscavi S.r.l.	
Planner / Designer	IREN-Ireti	

*Click on the video image below and watch Massimo Cacaveri, Sales Manager of Amiblu Italia, and Stefano Guiducci from Euroscavi Srl talk about the construction site and benefits of this installation method!* 





bit.ly/NC-Relining-Piacenza

MEX

## Egg-shaped GRP pipes for major sewer rehab in Bucharest

In Romania's capital, 5200 m of Amiblu NC Line pipes and 63 m of circular Hobas pipes were installed via relining to renovate an aged brick sewer system. The project is part of a large initiative to modernize Bucharest's entire sewer system.

ICE

From 25 to more than 100 years: That's the fairly advanced age of the sewer system of the metropolis Bucharest. It was therefore decided to renovate the extensive system step by step in order to increase its efficiency and reliability. One of the sections to be rehabilitated is a particularly challenging one: near the Parliament house and old town, where space and accessibility are limited. Conditions that called for a special approach – and the perfect solution was found with Amiblu.

After thorough technical considerations, a contract was signed over the supply of 5200 m egg-shaped non-circular GRP pipe profiles in a range of cross-sections. Within almost two years, six out of seven sections of the aged sewer were successfully relined with Amiblu NC Line pipes – each with profiles of a different width (780-1700 mm), height (1200-2550 mm), and wall thickness (14-24 mm). The seventh and last part is currently being supplied and shall be installed by end of 2019. Another 63 m of circular Hobas GRP sewer pipes were also installed via relining. Once finished, the rehabilitation project will improve environmental protection as well as the safety of Bucharest's water and sewer system and reduce its overall operating costs considerably.

Left: Limited space and accessibility at the construction site in Bucharest's city center. Top right: 63 m of circular Hobas sewer pipes were installed via relining. Bottom right: Amiblu NC Line pipes make the old channel as good as new.

PROJECT PARAMETERS		
Country / City	Romania / Bucharest	
Year of construction	2018/2019	
Application	Sewer	
Installation	Relining	
Technology	Amiblu NC Line	
Total length	5200 m	
Pipe characteristics Amiblu NC Line	1200/1800mm, 1200/1752mm, 1400/2100mm, 800/1200mm, 900/1350mm, 780/1580mm, 1000/1500mm, 1700/2550mm	
Pipe characteristics Hobas CC	DN 1600 SN 10,000 PN 1	
Client / Investor	City of Bucharest	
Contractor	Tahal Consulting Engineers Ltd	
Official installation subcontractor	MTStroy SRL	
Planner / Designer	Parcis	







## "We totally convinced them of the benefits of Amiblu NC Line"

Costin Berbecaru, Amiblu Sales Director for South-East Europe, talks about the complexity of the NC relining project in Bucharest.

### Let us start at the very beginning: What's the background of this project and what were the reasons for the client to choose Amiblu?

**Berbecaru**: The sewer rehabilitation in Bucharest is a large-scale project and involves a number of stages and locations. In April 2016, TAHAL and Bucharest City signed a contract for the implementation of different works. These include a shotcrete rehabilitation section, the sealing of joints, a microtunneling installation of a new collector, and the rehabilitation through GRP relining over a length of almost five kilometers. For this last section, TAHAL initially had a different pipe supplier in mind, but in the end we totally convinced them of the benefits of Amiblu GRP: The established brand and quality, best quality-price ratio, availability of our full knowhow and experience, and the flexibility with which we were able to adapt the pace of deliveries to their needs. The supply contract was signed in November 2016. The first order for half of the project was supplied in December 2017, the second in September 2018, and a 3<sup>rd</sup> and 4<sup>th</sup> order followed.

## *Given the complexity of the project with regards to the site location and pipe shapes – which preparatory work was done by Amiblu?*

**Berbecaru**: Our experts team performed several tests and FEM<sup>11</sup> calculations, created reports and procedures, in order to perfectly customize the non-circular profiles to the existing channel's varying diameters and conditions. The pipes' wall thickness, for example, was defined and calculated according to the project load using the 3R2014 and ISO 16611 method. The NC product offers an equal or even greater equal vertical deformation resistance compared to a SN 10,000 circular pipe of the same height.

#### How were the pipes transported to the construction sites?

**Berbecaru**: The pipes were delivered to the different locations right in the heart of Bucharest on smaller trucks which were equipped with cranes. This way we could optimally adapt to the narrow streets and heavy traffic as well as the restricted possibilities for unloading and storing the pipes on site. Our Amiblu project teams are perfectly at ease with such challenging logistics and site conditions since many trenchless projects are realized in urban areas.

That's certainly a huge benefit! So, the pipes were then inserted into the old channel? **Berbecaru**: Exactly. Both the NC profiles and circular pipes were lowered into the old brick sewer through a shaft with a crane or forklift and then either moved horizontally by a trolley or pulled with a steel rope by a crane from the opposite side. The single pipe segments of the same dimension were joined through belland-spigot joints with elastomeric gaskets with the support of the working staff, who helped to perfectly adjust the position of the profiles. Differently shaped sections were connected via manholes, after centering and fixing the pipes by



Our Amiblu project teams are perfectly at ease with challenging logistics and site conditions since many trenchless projects are realized in urban areas.

– Costin Berbecaru Amiblu Sales Director South-East Europe

<sup>1)</sup>FEM = Finite Element Method

means of spacers of different materials. Depending on the weight, position, and dimension of the pipes, the necessary force of connection was provided either by forklift, hoist, or manual tools. The new pipes were then fixed inside the aged channel with an innovative method of welding bolts and nuts into each pipe, on minimum four and maximum eight points, which results in a strong fixation between old and new pipe.

## Any notable implications of the installation works on traffic and Bucharest's inhabitants?

**Berbecaru**: Nothing considerable, not even during grouting, which is the installation phase that requires most machinery – compressor, mortar truck, mortar pump, water tank, etc. – and space. We completed 90 percent of grouting works at nighttime so to not disturb the traffic.

How about the remaining part of this large rehabilitation initiative: Will Amiblu be involved in further sections? Berbecaru: You are right, there's still a lot of work to be done and Amiblu has been involved from a very early stage. Bucharest is currently preparing a documentation to access EU funds through the POIM program (operational program for large infrastructure). Another project is currently in preparation, which involves rehabilitation measures with both circular and NC pipes of the sewer network in three districts: Cotroceni, Regina Maria, and Tineretului. We are offering our full support, knowledge, and experience to find viable solutions and quality products and create a sustainable pipe system. In fact, after completion of this project, the client is very satisfied with our professional approach and interested in maintaining the partnership for further stages.

Below: A low-impact trenchless installation: The relining process hardly affected the traffic flow around the construction site.





## Little time, little noise: Amiblu renovates NC sewer in Essen

In the middle of a residential district in Essen, Germany, an aged sewer has been relined with 180 m Amiblu NC Line egg profiles in merely six weeks. Traffic and citizens were not affected by the installation works.

Poor structural condition, insufficient flow capacity: These two properties of an old sewer made it clear for Stadtwerke Essen that a renovation was necessary. Initial thoughts about a completely new construction were quickly dropped in favor of a more effective relining rehabilitation. And it was Amiblu NC Line to prevail as pipe material: With the high structural strength at small wall thickness and corrosion as well as abrasion resistance, the new pipeline guaranteed an optimal flow rate combined with a very long, low-maintenance service life.

The project was optimally planned and implemented thanks to the outstanding communication and cooperation of all participants.

– Johannes Leewe Aarsleff Rohrsanierung GmbH, Contractor

In order to reconstruct the partly curved old channel and exploit its height and width in the best possible way, Amiblu custom-manufactured non-circular profiles in lengths from 0.5 to 3 m. The GRP segments were lowered into the aged brick sewer through one pit located in the middle of the pipeline and then transported to their final positions with a special sewer wagon. The annular space between the old and new sewer channel was filled with liquid mortar and the installation completed after only six weeks. The client, contractor, planner, and also local residents are very happy about the professional, fast, and noiseless implementation of the project. Holger Hörnemann, Amiblu Germany GmbH: "It was a pleasure to work with such experts to achieve this great result."

*Right: The non-circular GRP pipe segments were inserted into the aged brick sewer.* 





#### **PROJECT PARAMETERS**

Country / City	Germany / Essen
Year of construction	2019
Installation time	6 weeks
Application	Sewer
Installation	Relining
Technology	Amiblu NC Line
Total length of pipe	180 m
Pipe diameter	1980/1480 mm
Client	Stadtwerke Essen
Contractor	Aarsleff Rohrsanierung GmbH
Planner / Designer	Stadtwerke Essen



Top: Amiblu NC Line pipe with circular inspection shaft.

## Aged brick culvert in UK rehabilitated with Amiblu NC Line

The culvert known to Network Rail as RBS2/57A Tipton, over which run two non-electrified tracks, is a 68 m long brick built arch construction with a constantly flowing water course running through it. Over time, the culvert had suffered wear and tear and required maintenance before it was too late and would need to be replaced. Using trenchless technology to avoid any excavations and closing the track, Amiblu's NC Line – GRP structural liners were selected to renovate and restore the culvert, lengthening its lifetime without disruption to the nearby residents, or rail operations.

Amiblu NC Line is an off-site manufactured structural pipe relining system created specifically for trenchless installation and designed to withstand acidic and abrasive environments. As no two culverts are the same, Amiblu produced the NC pipes 2116 /1636 mm bespoke for this project in the company's state-ofthe-art manufacturing facility in Gdansk, Poland.

Before installation works started, the team from contractor Eric Wright Group created a wooden template to replicate the NC Line units. The template was passed through the culvert to highlight areas that needed attention to ensure the installation of the 1.5 m long units could take place without obstruction. The condition of the culvert was classed as 'poor', preparation works included lowering the floor in places where high points and obstacles caused by heave to the invert and remediation of loose or displaced brickwork to the side walls and soffit. Access and working space on site were very tight. Each NC unit was lowered into place with a compact excavator, then slid through the full extent of the tunnel along a steel bar track with the assistance of an electric winch and manual guidance by the installation team. The jointing system for this NC Line system is a spigot and socket joint with an elastomeric gasket seal, requiring no use of glue or sealants. Once all units were in place, the annulus was grouted and a specialist bricklayer from the local area was employed to complete the project, creating the external brickwork according to the original construction.

> Amiblu worked with us to ensure the units were manufactured to the specification and delivered to suit our site needs. All parties are very pleased with the result.

> > – Jonathan Leek Eric Wright Group, Contractor



Above: A wooden template in the form of the NC units helped identify critical areas in the old channel ahead of installation works. Below: The finished Amiblu NC Line sewer features perfect structural stability and corrosion resistance.

Now complete, the life of this Network Rail asset has been extended without disruption or track closures. Jonathan Leek, site agent for Eric Wright: "This was our first project of this nature for Network Rail, we have learnt a lot about the installation process of these liners and the capabilities of our own team. Amiblu worked with us to ensure the units were manufactured to the specification and delivered to suit our site needs. All parties are very pleased with the result." Amiblu NC Line pipes are manufactured, tested, and approved according to ISO 16611, the relevant international pipe standard for non-circular pipes and in addition, the system has full traceability with each unit being individually identifiable.



#### **PROJECT PARAMETERS**

Country / City	UK / Tipton
Year of construction	2019
Installation time	1 month (March)
Application	Sewer
Installation	Relining
Technology	Amiblu NC Line
Total length	68 m
Pipe diameter	2116/1636 mm
Client	Network Rail
Contractor	Eric Wright Group
Planner / Designer	Network Rail



## Hobas and Flowtite pipes upgrade Poland's largest WWTP

Better together! For the extension of the wastewater treatment plant (WWTP) Czajka in Warsaw, Hobas PU Line pipes De 3000 and Flowtite pressure pipes up to DN 2800 were installed both via jacking and in open trench. They build the process pipe system of a huge storage reservoir.

As in many capital cities, constantly growing – a to infrastructure above and below ground. One treatment plant Czajka, WWTP in Poland. The upgrade involved the concrete reservoir for the connected process Amiblu to produce and supply the complex pipe The newly built system should allow for a proper from the combined sewer system of Warsaw's varithe WWTP.

Due to sulfuric acids and sedimentation processes, pipes and storage systems for sewage treatment plants need to come with a particularly high corrosion resistance and lowest possible maintenance to ensure a problem-free long-term operation of the plant. With Hobas PU Line, Amiblu offers a product that is tailor-made for such conditions: The pipes' inner protection layer of polyurethane features an increased chemical resistance and extended lifetime even in aggressive environments. The pipes show a very high resistance to sand abrasion, which is very common in combined sewage systems. The smooth inner surface ensures that deposits collected during periods with less or no flow do not pile up – a very important fact, given the intended periodical use of the reservoir.

It was therefore decided to use Hobas PU Line pipes De 3000 for the main transmission pipeline between the storage reservoir and the main process system of the WWTP and install them via microtunneling. Despite their relatively small wall thickness of 94 mm, the pipes can handle enormous jacking forces of more than 13,500 kN.



Above: De 3000 – the largest-diameter Hobas PU Line pipes installed via microtunneling so far. Below: Flowtite FW pipes up to DN 2800 were installed in open trench.





On March 16, 2019, the first and most challenging section with a length of 136 m was completed. It led under an active open channel of the sewage treatment plant and allowed for the flow in the channel to be maintained – with open trench technology, this wouldn't have been possible. The sandy soil (type G1) required the use of a special microtunneling machine with a mud chamber, which limits ground subsidence and uncontrolled soil displacement. Microtunneling works progressed with an exceptional speed of almost 40 m a day.

Flowtite GRP pressure pipes and fittings were used to build the rest of the supply system with a total length of 688 m. The process system of the reservoir involved more than 20 T-pieces DN 2800/1000, 2800/1200, and 2800/1000 with an individual design adapted to the height of inlets and outlets located in the reservoir walls. The main part of filament wound pipes was installed in open trench, a short section in the area of the pumping station was realized via jacking with Flowtite pressure pipes De 1720.

The challenging installation was completed within two months only. The use of Flowtite and Hobas pipes in this project is a perfect example of how products from the portfolio of Amiblu perfectly complement each other.

#### **PROJECT PARAMETERS**

Country / City	Poland / Warsaw		Open trench: DN 600-2800 /
Year of construction	2019	Pipe characteristics	SN 10,000 / PN 6-10
Installation time	2 months (April-May)	Flowtite Pressure Pipes + Tees	Jacking: De 17207 PN 67 SN 32,000
Application	Sewer		Total length: 200 m
Installation	Microtunneling, open trench	Client / Investor	MPWIK W-wa
Technology	Hobas PU Line,	Contractor	IDS-BUD S.A.
icciniology	Flowtite pressure pipes	Installation subcontractor	Sanimet
Pipe characteristics	De 3000 / SN 32,000 / PN 6		
Hobas PU Line	Total length: 200 m	Planner / Designer	Cdm Smith

Below: Microtunneling works progressed with an exceptional speed of almost 40 m a day.



## Sustainable rehab with Hobas CC-GRP products in Denmark

In the town of Fredericia, located on the Jutland peninsula in Denmark, 400 m centrifugally cast Hobas pipes and fittings were installed as part of a major sewer system renovation.

The sewer network in the Danish town of Fredericia is made of clay and concrete, and in several sections the pipe dimensions are much too small to handle the growing amounts of stormwater. As a result, parts of the town are regularly flooded. It was therefore decided to renovate and extend the entire sewer system with a major project running over the next 10 years.

Among the pipe materials competing for the first part of the project were concrete, PE, PP, and GRP. Amiblu won the tender for a number fo reasons, among others the quick and easy installation and the products' very long lifetime. Approximately 400 m of Hobas GRP pipes DN 1600, including several shafts were installed in open trench. And this was just the beginning: Over the next 10 years, approximately 20 km of Hobas GRP pipes DN 900 to DN 1600 including several shafts are planned to be installed in open trench.

#### **PROJECT PARAMETERS**

Country / City	Denmark / Fredericia
Year of construction	2019
Application	Sewer
Installation	Open trench
Technology	Hobas CC
Total length of pipe	~400 m (1 <sup>st</sup> project part)
Nominal Diameter	DN 1600
Nominal Stiffness	SN 10,000
Nominal Pressure	PN 1
Client / Investor	Fredericia Spildevand
Contractor	Per Aarsleff A/S



Above: Approximately 400 m of Hobas GRP pipes DN 1600, including several shafts and fittings, were installed in open trench as part of the comprehensive sewer rehab project in Fredericia.



## Special cross-drainage culvert installed in record time

Amiblu Netherlands has completed a special project on behalf of KWS Infra Zwolle in the municipality of Almelo in Eastern Netherlands: Parts of an existing concrete sewer pipeline close to the wastewater treatment plant Vissedijk had to be lowered in order to create space for a new crossing sewer line. The location and direction of the two old DN 1500 concrete connections in combination with the very limited installation space posed a great challenge to the planners. The project required a highly flexible approach and a material that allowed for an uncomplicated installation and custom solution. And it was Amiblu to win the tender: A CC-GRP culvert consisting of an S-bend (built of single short pipe bends), adapter pipes DN 1500 to connect the culvert to the old concrete drainage pipe on both sides, and an approximately 5 m high inspection shaft DN 1600 were delivered to the construction site and installed in only one week. The project was completed to the great satisfaction of all parties involved.



Above: A Hobas CC-GRP shaft and S-bend were installed to build a cross-drainage culvert.

#### **PROJECT PARAMETERS**

Country / City	Netherlands / Almelo
Year of construction	2019
Installation time	1 week
Application	Cross-drainage sewer
Installation	Open trench
Technology	Hobas CC
Total length of pipe	30 m
Total length of pipe Pipe characteristics	30 m DN 1500 SN 10,000 PN 1
Total length of pipe Pipe characteristics Client / Investor	30 m DN 1500 SN 10,000 PN 1 Gemeente Almelo
Total length of pipe Pipe characteristics Client / Investor Contractor	30 m DN 1500 SN 10,000 PN 1 Gemeente Almelo KWS Infra Zwolle

## GRP and liquid soil: a perfect match

GRP pipes and liquid soil fit together excellently! You can find proof of this fact in the German municipality of Nordwalde, North Rhine-Westphalia, where an aged sewer channel has been replaced with Hobas GRP pipes DN 1000. The trench has been filled with selfcompacting liquid soil, resulting in an optimal, void-free buoyancy protection.





## Hamburg relies on Amiblu NC Line for combined sewer rehab

In Germany's second largest city Hamburg, a sewer channel is called "Siel". Hence the project name "Stammsiel Eilenau / Kuhmühlenstammsiel", in the course of which a 1357 m long combined sewer channel was rehabilitated through relining of Amiblu NC Line pipe profiles. Reasons for the client Hamburger Stadtentwässerung to opt for Amiblu were the environmentally friendly trenchless technology, the overall cost efficiency, the safe long-term pipeline operation, and many good experiences with GRP. The construction company Tauber Rohrbau Münster successfully installed 978 m NC Line pipes with a cross-section of 1520/1820 mm and 369 m pipes with 1930/2360 mm between July 2018 and 2019.

Country / City	Germany / Hamburg
Year of construction	2018/2019
Installation time	1 year
Application	Sewer
Installation	Relining
Technology	Amiblu NC Line
Total length of pipe	1347 m
Pipe diameter	1520/1820 mm (978 m) 1930/2360 mm (396 m)
Client / Investor	Hamburger Stadtentwässerung
Contractor	Tauber Rohrbau Münster

**PROJECT PARAMETERS** 

Above: The 1357 m long combined sewer channel was relined with Amiblu NC Line pipes.

## **Corroded steel culverts renovated with Flowtite GRP**

In the Spanish region of Galicia, seven road drainage culverts have been relined with Flowtite GRP pipes DN 800 to DN 1600. The original steel culverts were severely damaged by corrosion and the resulting structural failure, and GRP was considered the best choice due to the material's corrosion resistance and superior hydraulic characteristics. It took the contractor COPASA only 2 months to rehabilitate a total of 249 m drainage pipe, and the Spanish Ministry of Development (MFOM) is very satisfied with the quick and smooth installation.





## Freshly launched and ready for download: Product Guide & Technical Product Data

It's getting increasingly busy in the Download section on the Amiblu website: Three brandnew product data brochures are now available which provide you with in-depth figures related to non-pressure Hobas and Flowtite pipes as well as non-pressure Hobas jacking pipes. For technical data concerning Amiblu products in general, you can consult the updated version of the Amiblu Product Guide. **Click on the buttons below to download the individual catalogues!** 







## Product Selector @amiblu.com

38, 194 – that's the amazing number of possible fittings variations currently available in our Product Selector on the Amiblu website! The constantly growing database contains all different Elbows, Tees, Wyes, and Reducers that can be generated from Flowtite and Hobas GRP pipes. You'd like to find out about a particular fittings combination for your project? **Click on the picture on the left or the link below to access the Amiblu Product Selector!** 

#### Click HERE to access the Amiblu Product Selector

#### www.amiblu.com/amiblu-products/



Amiblu is a 50:50 joint venture whose goal is to develop and deliver fully sustainable water solutions. Amiblu combines Amiantit Europe and its Flowtite Technology, and Hobas Europe, part of WIG Wietersdorfer Holding, and is the specialist in wastewater, drinking water, irrigation, hydropower and industry.

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