# Two-Meter CIPP Giant, Zero Downtime: UV-Cured GRP Relines Main Collector in Belgium



Bypass of 13,000 m<sup>3</sup>/h: Pumping stations and pressure sewer pipes to divert the flow from the rehabilitation stretch to ensure continues flow towards WWTP

First in Belgium: a DN 2000 sewer collector that can't stop for a second is being rehabilitated with UV-cured GRP liners. The unique twist? They have to keep a whole city running with a bypass of 13,000 m³/h while crews worked just before the treatment plant. To show how that's engineered, international experts were invited on site. Amongst them: IKT's Ashwini Ausekar, who shares insights from her site visit.

Belgian sewer operator Aquafin and their contractor TM Kumpen — Willemen Infra hosted a site visit for project partners and international guests at the wastewater treatment plant RWZI in Bruges, Belgium. They witness first-hand the renovation of the major sewer collectors serving 238,500 residents. Massive collectors (diameters 1500–2000 mm) that transport wastewater from the city and surrounding area are being structurally renewed.



Extracted piece of host reinforced concrete pipe shows corrosion with coarse aggregates and dissolved reinforcement bars.

This remarkable rehabilitation covers a total length of 156 meters, installed with a pull-in method and cured using 36 kW UV lamps progressing at approximately 45 cm per minute. The GRP liners, supplied by Impreg, were transported to site with a total weight of 100 tons.

## Why Renovation Was Urgent

Inspection revealed that the reinforced concrete host pipes, originally 19 cm thick, had in some places been reduced to as little as 2 cm due to severe corrosion caused by hydrogen sulfide (H<sub>2</sub>S). In certain sections, reinforcement steel had already dissolved. Without intervention, the risk of sewer collapse and subsequent sinkholes would have been high, with major social, ecological, and economic consequences.

To guarantee continued wastewater transport during the works, a temporary bypass pumping system was installed, capable of **diverting up to 13,000 m³/hour** to the treatment plant. This ensured uninterrupted operations while rehabilitation proceeded in 60-hour continuous shifts.



Details of the challenging CIPP rehablitation site in Bruges/Belgium are explained to visitors.

# A Project of Exceptional Complexity

**Christa Coppens**, Project Manager at Aquafin, highlighted the unique challenges:

- •Long and large-diameter (1500-2000 mm) pressure pipelines at depths up to 9 meters
- Highly permeable and potentially contaminated soil
- Strong H<sub>2</sub>S formation and severe pipe deterioration
- Need for sustainable execution with minimal disruption
- Requirement to maintain continuous wastewater treatment plant discharge



100 tonnes on the way: the DN

2000 large CIPP liner from Impreg

## **Optimized CIPP Solution**

Given the complexity, Aquafin opted for a competitive procedure with negotiation rather than a traditional open tender. This approach enabled contractors to propose optimized solutions within defined boundaries, fostering collaboration, trust, and innovation.

# Relining with Quality and Safety at the Forefront

According to **Gert-Jan Merkx**, General Manager at Kumpen, success depended on combining technical expertise with strict safety management. Deep excavations, manhole rehabilitations, and access shafts were managed under stringent safety rules, with all site visitors wearing helmets, safety shoes, and high-visibility vests during the tour.



Danny Baeten, director of project management at Aquafin, delivering the welcome note to around 30 delegates from Europe

Quality control was also a priority: samples were tested, installation software protocols were monitored, and additional sensors measured UV radiation, viscosity, and temperature

development during curing.

# **Preventive Management Pays Off**

**Danny Baeten**, Director of Project Management at Aquafin, emphasized the wider context:

"Every  $\$ 1 invested in preventive management saves  $\$ 3-5 in emergency repairs and damage. By renovating today, we safeguard public funds, protect past investments, and avoid costly surprises tomorrow."



International experts visit the CIPP job site in Bruges, Belgium

The Flemish sewer network, valued at over €10 billion, faces increasing pressure from aging infrastructure. Proactive projects such as Bruges demonstrate the importance of timely rehabilitation to avoid ecological damage, sinkholes, and untreated discharges into nature.

## An International Exchange of Knowledge

The site visit at RWZI Brugge welcomed over 30 delegates, including participants from the Netherlands (Arnhem), Germany, and Belgium. The group toured the site in teams of six, observing preparations such as the installed preliner, protective foils, and manhole laminations. Installation of the

impregnated GRP liner began the following day, with continuous work planned for 60 hours.



IKT's Ashwini Ausekar visiting the rehabilition job site in Bruges, Belgium

During the visit, **Danny Verhulst** from Aquafin kindly hosted the tour in English, for Ashwini Ausekar. We had engaging discussions on innovation in sewer rehabilitation, particularly regarding corrosion and acid attack in concrete pipes — an issue of growing relevance across world. His openness in sharing expertise and perspectives made the exchange especially valuable.

Ashwini Ausekar was very impressed: "This project is a milestone for trenchless rehabilitation in Europe. The combination of scale, innovative UV-cured GRP technology, and the collaborative procurement model sets a new benchmark for complex underground infrastructure works. I am grateful to Aquafin and TM Kumpen — Willemen Infra for the kind invitation and warm hospitality, and especially to Danny Baeten and Danny Verhulst for making the visit both insightful and inspiring."

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# Down Under: What are the performance limits of CIPP liners?



Dr. Iain Naismith presenting interim results of our international LinKa — Liner for Sewers research project in Melbourne

Liner for Sewers research project were presented at the headquarters of the Water Services Association of Australia (WSAA) in Melbourne. The event brought together project partners from Australia and New Zealand in a hybrid workshop setting to discuss first findings and exchange expertise. Many Questions were asked, many answers were given.

## LinKa - an international research project

With LinKa, we are investigating the performance limits of Cured-in-Place Pipe (CIPP) liner applications. CIPP is one of

the most widely used trenchless rehabilitation methods for sewer systems worldwide. But how far can this method go when it comes to damaged or highly stressed pipes?



Ashwini Ausekar and Dr. Iain Naismith presenting on our hybrid workshop at WSAA headquarters.

To answer this question, we have set up several 1:1 scale test rigs. These rigs replicate real-life sewer conditions and include a variety of predefined damage scenarios — such as cracks, fractures, or deformations. The scenarios were developed in close collaboration with a steering committee of public sewer network owners, ensuring that the research reflects practical challenges faced by operators.

## Testing and evaluation

CIPP manufacturers have installed their liners in these full-scale test rigs. Our task is to **evaluate the performance** of the different CIPP liners employed under realistic conditions and to provide detailed reports to the participating sewer network owners. In this way, the project creates a transparent basis for evaluating liners and understanding their application limits.



James Gardner, Water Services Association of Australia (WSAA)

## A broad international network

LinKa is truly international in scope: 40 sewer network operators from Australia, Belgium, Germany, Ireland, the Isle of Man, the Netherlands, New Zealand, the States of Jersey and the United Kingdom are actively involved. This broad participation ensures that findings are relevant not only for one country, but for sewer operators worldwide.

## Interim results in Melbourne

The interim results were recently presented by our colleagues **Dr Iain Naismith and Ashwini Ausekar** at WSAA in Melbourne. The hybrid workshop format allowed our partners from various Australia and New Zealand utilities to attend in person or online. The event sparked valuable discussions about the first findings and the next steps in the project.



James Goode, Water Services Association of Australia (WSAA)

# Coordination in the Southern Hemisphere

In the Southern Hemisphere, the project is coordinated by WSAA, the national association of water suppliers and wastewater utilities in Australia. **James Gardner, James Goode and Greg Ryan** represented WSAA at the event. From our side, our Managing Director Roland W. Waniek joined the workshop in person.

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# IKT attends the China-Europe Trenchless Technology Conference



Roland W. Waniek and Prof Dr. Bert Bosseler from IKT at the "2024 China-Europe Conference on Pipelines and Trenchless Technology"

IKT's Managing Director, Roland W. Waniek, and Scientific Director, Prof. Dr. Bert Bosseler, have attended the "China-Europe Conference on Pipelines and Trenchless Technology" at the end of March 2024, where they presented the latest IKT research results on the subject of pipe liner quality.

The event was organised by Prof. Dr. Jingguo Cao from the Tianjin University of Science and Technology.



Participants at the "2024 China-Europe Conference on Pipelines and Trenchless Technology" in Jinan, China

The event brought together more than 700 experts in the metropolis of Jinan, the capital of Shandong province on the south bank of the Yellow River.

Prof Bosseler spoke about "Quality Assessment of CIPP Lining in Sewers" and Roland W. Waniek spoke about "International Trenchless Development Trends".



Prof Dr. Bert Bosseler gives a lecture on "Quality Assessment of CIPP Lining in Sewers"

Bert Bosseler presented the latest IKT research results on the

quality assurance of CIPP liners, whilst Roland Waniek highlighted the advantages of trenchless construction and renovation in densely populated regions against the backdrop of economic and climate-related challenges.

The two had further interesting discussions at the Tianjin North China Geological Exploration Bureau, at the Tianjin Municipal Drainage Department and at the China International Petroleum & Petrochemical Technology and Equipment Exhibition in Beijing.

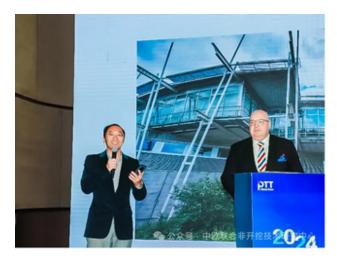


CIPP liner construction site in China

The programme also included a visit to a CIPP liner construction site in Jinan and a tour of a CIPP liner and Spiral Wound Lining manufacturer in Gongjiatun.

And at the end there was also a short detour to the Great Wall of China to the north of Beijing — very impressive!

The Chinese hosts will be making a return visit to the IKT with a delegation in May 2024 to discuss further cooperation on the topic of sewer rehabilitation. Before that, they will visit the IFAT exhibition in Munich.



Roland W. Waniek speaks at the Tianjin Municipal Drainage Department / China

You can find a detailed report from our Chinese hosts about this trip here:

Chinese report on the IKT visit to China

More information about quality assurance for CIPP liners: Neutral and independent: IKT test centre for CIPP liners



Talks at the "Tianjin North China Geological Exploration Bureau"



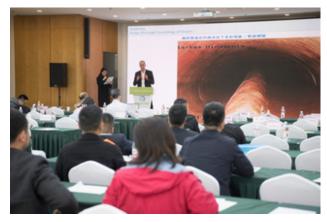
Prof. Dr. Bert Bosseler visits a CIPP liner construction site in Jinan, China



Prof. Dr. Bert Bosseler speaks at the Tianjin Municipal Drainage Department / China



Audience at the Tianjin Municipal Drainage Department / China



Lecture by Prof. Dr. Bert Bosseler at the "2024 China International Petroleum & Petrochemical Technology and Equipment Exhibition" in Beijing

# CIPP quality: Lessons learned from 25 years of research and testing



Taking a closer look: neutral and independent CIPP tests by IKT

CIPP liner quality: What is the essence of two decades of IKT's research?

Prof. Dr. Bert Bosseler, our Scientific Director, and colleagues identify the key factors that are crucial for the quality of the world's most popular rehabilitation process for sewer pipes, Cured-in-Place-Pipes (CIPP).

In a peer-reviewed journal paper we have summarized all our findings. It is a comprehensive compilation of many research projects and many thousands of CIPP tests over the years.

We also highlight the challenges that remain and the key research issues that still need to be resolved.



Prof. Dr.-Ing. Bert Bosseler, Scientific Director of IKT

## Download paper

Read now our findings in this peer-reviewed paper, free for download:

Quality assessment of CIPP lining in sewers: Crucial knowledge acquired by IKT and research gaps identified in Germany

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### CIPP Test Center

Find out more on how we test CIPP liner in our test center: IKT's Test Center for CIPP Liner

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# How testing CIPP liners helps sewer network owners protect their scarce money



IKT's Test Lab: Three-pointbending test of CIPP sample

How can you as a sewer network operator be sure that your newly installed CIPP liner is of good quality? How sure can you be that it will actually last the promised **50+ years**? How can you know whether you have received the promised quality for your good money? There is a reliable yet inexpensive way to find out.

CIPP liners are made on site under conditions that are **difficult to control**. Every job site is different and liner quality depends on many factors. For example, the human factor and the environmental conditions play a major role.

CIPP liners are always created in situ on the day of installation. The **risk is high** that work may be done too quickly and too carelessly on the job site. Therefore, you cannot always be sure you have really received a good quality CIPP installation.



Initial assessment of a CIPP

sample: searching for weak

spots

## **CIPP Quality Risks**

You have to ask yourself: Were the curing **specifications** complied with? Is the wall thickness strong enough to withstand ground water pressure? Was a cheap or an expensive resin used? Is the liner really water tight?

Liners with poor material characteristics may not be stable and sufficiently **load-bearing**, and leak. Above all, they do not achieve the promised service life. Then you might have spent a lot of money for nothing and have to replace the liner with a new one at an early stage.

In the worst case, the sewer pipe has to be completely replaced with a new one. A very **expensive affair**.



Water tightness test

## Certainty through laboratory testing

You can avoid all this by having tested your CIPP by IKT's lab directly **after installation**. For you, this is quite simple: You just have to extract a sample from the installed liner and send it to us.

We will determine the most important material parameters and

compare them with the expected target specifications. We will also test your sample for water tightness.

Then you will receive an expert **test report** that can give you peace of mind.



Water tightness test with red dyed water

## Neutral and independent testing

Our CIPP test center carries out **around 4,000** such quality tests every year. And we do so completely neutrally and independently, free from the economic interests of liner manufacturers and rehabilitation companies.

This is because we are a **neutral and non-profit** research and testing institute supported by more than 150 German municipalities, including Berlin, Munich and Hamburg.

We have been conducting quality tests on CIPP liners for more than 25 years and for which we have a strong reputation.



Rig for long-term tests

## Contact us for testing

So if you also want to have certainty about the quality of the CIPP installed at your site, contact us and we will make you a quote **immediately**. We will explain to you how to take the samples and how to send them to us. It is much easier than you think!

## Your contact person

Dieter Homann is the longstanding **director** of the IKT laboratory. He is a widely recognized expert who participates in numerous expert panels in Germany and abroad. He will help you understand the complexities of CIPP quality and interpret test results. Contact him, he will be happy to answer all your questions!



Dieter Homann, Director of IKT's Test Centre for CIPP

### liners

Simply address your questions to:

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More information on our CIPP testing procedures and how to

send us your samples:

IKT Test Center for CIPP

See also an **overview** of our CIPP test results in our annual

IKT LinerReport from 2003 until today:

IKT-LinerReport