Roediger

SEWER SYSTEMS

Wastewater management with vacuum sewer systems:

The intelligent solution for a modern wastewater infrastructure

A brand of
Aqseptence Group

Livable neighborhoods with intelligent infrastructure: We make it possible

Developing new urban districts in the midst of metropolitan regions and thereby creating new living spaces for hundreds of people - this is one of our core competencies. Installing kilometers of functional wastewater infrastructure in remote or economically challenged regions to ensure hygienic conditions - we have accomplished this task numerous times. Designing and constructing reliable sewer systems that do not falter even under extreme climatic conditions - this is not just our profession, but also our passion. At Roediger®, we excel wherever wastewater management requires thoughtful planning and future-proof solutions. We develop customized vacuum sewer systems that outperform conventional technologies.

Where today's challenges are concentrated, normality begins for us

First things first: vacuum sewer systems are not an alternative concept, nor are they an exotic solution for particularly unusual conditions. Vacuum technology represents something entirely distinct - it's the ideal response to the structural, environmental, or legal challenges that planners encounter today. It's the "new normal" for addressing issues like resource conservation, environmental protection, investment security, and budget efficiency.

What you can rely on:

- **Lower planning, construction and maintenance costs:**
  low installation depth, greater construction speed, low service costs, remote diagnosis option, unlimited scalability.
- **Unbeaten in terms of reliability, environmental protection and hygiene:**
  no exfiltration due to the design, supports future-oriented solutions such as differentiated recycling (source separation) through water-reduced transportation.

Sponge region and blue-green infrastructure: Roediger® changes the game

The development of new residential areas on the outskirts of cities, the densification of inner-city areas, and the need to convert buildings or entire areas are confronting urban planners everywhere with the same question: how can reliable and environmentally friendly drainage work - especially when the wastewater infrastructure is outdated, inadequate, or simply does not exist?

The answer lies in vacuum sewer systems. While conventional systems may struggle or even fail in such scenarios, vacuum sewer systems have successfully addressed this problem countless times. Whether in metropolitan areas like Hamburg or Ghent, new development areas such as Walldorf, or remote rural regions in Croatia lacking any prior sewer system, vacuum sewer systems have proven effective.
And in many cases, we didn't just discharge wastewater - we reduced water consumption by means of intelligent source separation, while massively increasing the recycling rate.

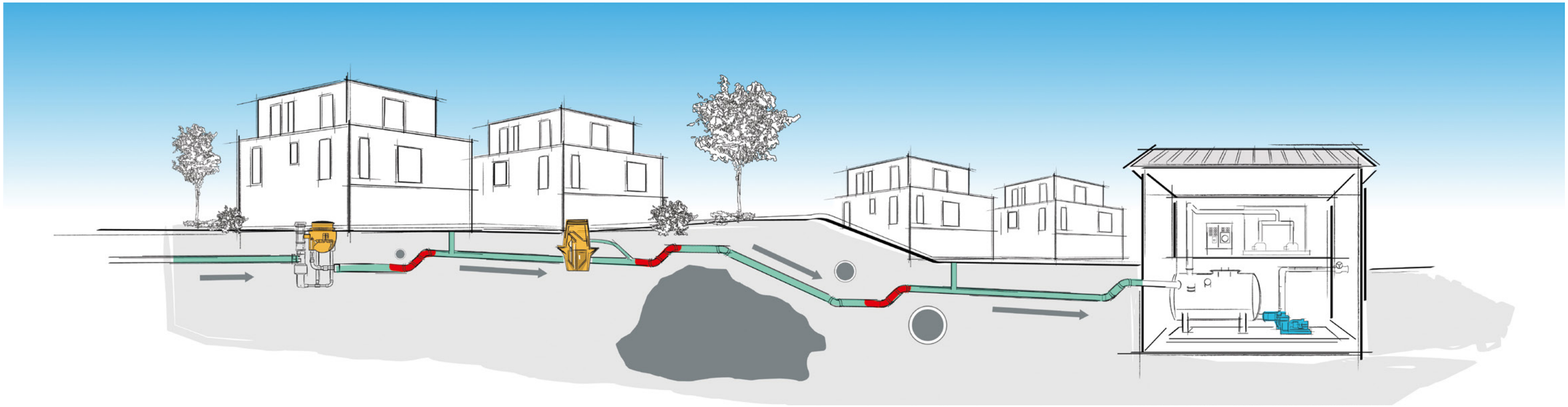
From +30 °C to -40 °C or 4.5 meters of water column: vacuum sewer systems can do it

Part of our claim to the "new normal" is that Roediger® solutions defy the changing conditions of climate change. Extreme temperature fluctuations of 70 degrees Celsius and more pose no problem for our systems, nor flooding. At the EXPO 2017 in Kazakhstan, we were able

to demonstrate how stable our technology is even in extreme temperature differences. In countless other projects in regions prone to flooding, our customers repeatedly react with relief to the fact that our sewer systems offer absolutely reliable protection against exfiltration.

Safer. Faster. Cheaper. We save you time and money.

The many advantages of a vacuum sewer system are not only noticeable after commissioning, but much earlier, namely when the planning begins. Vacuum technology can solve many problems that conventional gravity systems struggle with, and it is also much quicker to install. This is simply because the shallow installation depth means that only a fraction of the earth movement is required. Additionally, in many places, fresh water supply and wastewater disposal can be installed in a single, very shallow trench. This minimal effort pays off for you in the form of noticeably lower costs for installation and maintenance.



150 centimeters deep, 4.5 meters high, 6 meters/second fast:

Roediger® simply makes water flow differently

Say goodbye to gravity - why should you rely on vacuum systems?

Let it flow? Or actively pump it off? Conventional gravity flow systems and vacuum sewer systems are based on two completely different basic principles. In a gravity sewer system, wastewater flows off by itself with the help of gravity (but unfortunately not always). This process takes time and can lead to unpleasant odors or the formation of germs. Additionally, a significant gradient is required, which is synonymous with a large installation depth and the corresponding costs.

In vacuum systems, wastewater is transported by means of negative pressure, which is incredibly fast at 6 m/s and requires hardly any gradient. This method also makes it possible to bypass obstacles or transport the wastewater over them if necessary.

Conventional gravity systems	Vacuum sewer sytems
High constructive effort due to: ▪ large laying depth ▪ required gradient ▪ large pipe diameter	**Low constructive effort** due to ▪ small pipe diameter and extremely shallow trenches (150 cm on average, 80 cm is also possible) ▪ obstacles can be bypassed or jumped over - up to a total height of 4.5 meters
Slow drainage speed, thus risk of odor and germ formation	**High flow velocity,** resulting in rapid removal of sediments
Pipes must be flushed with fresh water; risk of drying out and rotting during long dry periods	**No flushing required;** possibility of **material flow separation** and therefore enormously high rate for differentiated recycling
Danger of overloading and dirty water leakage during heavy rainfall and flooding	**Absolutely leak-proof;** pump capacity can be easily adapted to extreme conditions

100% Made in Germany: Roediger® vacuum chambers, pumps and valves enjoy a unique reputation worldwide.

Shaft, pump, station - vacuum technology quickly explained

Vacuum sewer systems essentially consist of the core components vacuum chamber with vacuum valve and vacuum station with vacuum pump. All components are available in many variants for different tasks.
The wastewater is first collected in the vacuum chamber and, as soon as a certain volume of wastewater is reached, it is extracted via the valve by the vacuum pump as a result of the pressure difference. The process is controlled by the Roediger® control system in the vacuum chamber.

Stay in the loop - and keep track of everything, everywhere

Roediger® management and control systems for every application

Vacuum systems dynamically move wastewater, giving you the flexibility to intervene whenever needed. To support this, we've designed a range of monitoring and management systems. These tools enable you to monitor your system's status in real-time and make adjustments or corrections remotely as required.

Remote diagnostics and troubleshooting - Roediger® chamber management system RSMS

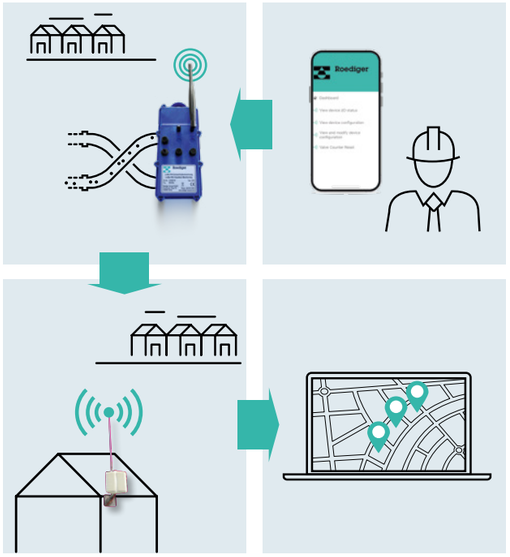
Efficient system control is made possible through our advanced Roediger® chamber management system, RSMS. This smart technology monitors your system 24/7, autonomously adjusts to changing conditions, rectifies minor issues automatically, and proactively identifies potential problem areas for timely maintenance. RSMS also provides real-time fault notifications with precise shaft localization, eliminating the need for laborious leak detection.

With the capability to accommodate up to 256 house connection chambers per cable, the system offers scalable expansion options, aligning seamlessly with your evolving plans without requiring additional infrastructure investments. Our RSMS solutions are already operational in various projects, including the Walldorf-Süd development area in Germany, where they ensure flawless monitoring and rapid response to necessary adjustments since 2020.

Simple control via app: Roediger® RSMS is smart technology for everyday use, saving human resources and municipal budgets.

Digital and wireless - Roediger® LoRa monitoring system

Experience seamless monitoring with Roediger® LoRa technology, providing a wireless alternative to RSMS. Gain valuable insights into your system's performance, swiftly identify and pinpoint faults, and remotely address issues in real-time. Perfect for modernizing existing systems, Roediger® LoRa solutions require no groundwork or cable installation. With its flexibility and scalability, you can seamlessly upgrade your wastewater system at your own pace, aligning expansion with your budgetary requirements.



Backed by proven efficacy, LoRa monitoring seamlessly transmits all vital data wirelessly to a centralized hub. Any irregularities are promptly reported to the operator's smartphone for swift action.

Ensure leak-proof operation, consider water level fluctuations, and prevent operator errors

Anyone looking to install a functional wastewater disposal system in marinas and inland ports faces three distinct challenges:

1. Firstly, it's crucial to guarantee that the system is completely leak-proof, minimizing the risk of sea and hinterland contamination in the event of a leak. This is a critical aspect that only a vacuum system can reliably ensure.

2. Manage extreme water level differences. Due to tidal variations at sea and fluctuating water levels in inland waterways caused by factors like droughts or floods, the system must adapt to varying base levels. Fortunately, this is easily achievable with a vacuum system, capable of handling height differences of up to 4.5 meters.

3. Handle changing operators with varying levels of expertise. Not every skipper is experienced or knowledgeable in handling extraction and disposal units. This is where our extensive experience comes into play: our technology is user-friendly and foolproof, even for inexperienced users.

Sensitive ecosystems.
Sensitive requirements.

Projects with zero error tolerance

> **Our greatest environmental strength lies in our vacuum system, where leaks are virtually impossible."**

Marina Porto Novi in Montenegro:
The perfect destination for the rich and beautiful? A showcase idyll for tourists and globetrotters? Yes, it is. It is also the perfect blueprint for all the challenges that politicians, companies, and society have to deal with today if they want to develop their region and lead into the future.

Absolute reliability as a planning principle

The azure sea, picturesque hinterlands, and pristine ecosystem ensure that destinations like Porto Novi attract a steady flow of tourists annually, bringing prosperity to the community and creating employment opportunities. Therefore, when it comes to developing new infrastructure in such areas, it's crucial to partner with a company that comprehends these complexities and offers sophisticated, tried-and-tested solutions. At Roediger®, we pride ourselves on our ability to adapt flexibly and tailor solutions to the unique local conditions, exemplified by our successful navigation of the challenges in Porto Novi.

Roediger® in Porto Novi - a convincing solution at all levels

In Porto Novi, we addressed all requirements at once with a combination of a marina system and vacuum sewer system. The total length of the pipes laid spans 2.5 kilometers, with connections directly installed on the concrete piers capable of accommodating wastewater from boats up to 110 meters in length.

Visually, the system is equally impressive: featuring a polished stainless steel finish, it exudes a top-class look that blends in perfectly with the postcard idyll.

Special highlights:

- **Integration of marina and sewage systems within a single project**
- Utilization of Roediger® Silentium vacuum toilets, Roediger® evacuation units featuring floor drains, Roediger® boat evacuation panels, ship evacuation points, and Roediger® bilge emptying systems
- Berths **up to 110 m boat length**
- Small diameter: pipes laid in concrete channels
- Network: **approx. 2.5 km**
- **Fault-free operation** since commissioning in 2018

About the person

Name: Georg Maurer

Function: Technical project manager and Head of Construction

Education: Studied environmental engineering at TU Darmstadt

With Roediger® since: 2017

“Developing solutions where others fail”

How vacuum technology is enabling new hygiene standards worldwide

A functioning, reliable wastewater infrastructure and decent hygiene conditions are still not a given everywhere. Sometimes it fails due to costs, but sometimes also due to challenging soil conditions. Vacuum technology provides the right solution for both of these challenges - as Georg Maurer, Head of Construction at Roediger® in Hanau, knows.

Is there such a thing as the „typical“ vacuum sewer project?

No, there isn't. With our technology, we used to have the reputation of being the specialized supplier for certain problem cases. But that is no longer the case today. I would even say that many of today's problems can no longer be solved with gravity sewer systems. For me, vacuum technology is therefore the new preferred solution strategy. We really are able to handle everything - including the special challenges that conventional systems fail to meet.

“With vacuum sewer technology, we have incredible flexibility to tailor solutions to each project's specific needs.”

What do you think is the greatest strength of vacuum technology?

The greatest strength of vacuum technology lies in its adaptability to a wide range of conditions, as it is not dependent on specific fundamentals such as gradients. This versatility opens up numerous other advantages. With a shallow pipe depth of approximately 80 to 150 cm, vacuum systems require less excavation, making them particularly advantageous for rocky ground or shallow islands. This not only reduces technical challenges but also lowers costs significantly. Digging deep pits in rock formations can be prohibitively expensive, whereas vacuum systems offer a cost-effective solution that is attractive even for economically weaker regions.

“Our cost-effectiveness also positions us as an appealing option for economically challenged regions.”

Can you give us an example?

We have implemented several sewer projects in Croatia that illustrate the benefits of vacuum technology in challenging geological conditions. In one area, connecting to a conventional sewer system wasn't feasible due to the geology, making it economically impractical. Instead, they relied on soakaways and regular wastewater extraction by tankers, which posed significant challenges for the 3,000 inhabitants and environmental concerns regarding groundwater contamination. We demonstrated the feasibility and financial viability of a vacuum sewer system during the initial planning process. Overseeing the project for two years, I ensured its successful implementation, culminating in a hygienically drained area with a functioning sewage system for the local population.

“And just like that, 3,000 people have access to a fully operational sewage system.”

Roediger®: Global trendsetter for vacuum technology

Roediger® has solidified its position as a leading system supplier for vacuum technology through innovative solutions, sophisticated engineering, deep technical understanding, and a strong commitment to providing expert advice and exceptional service.

Our work is based on the transportation of wastewater by vacuum - a highly efficient and sustainable technology that we use in its entirety:

With **sewer solutions** that ensure a state-of-the-art, scalable infrastructure even under the most difficult external conditions.
With **sanitation technology** that enables previously unimagined architectural and planning freedom - and at the same time creates completely new opportunities for resource recovery.
With an **all-inclusive offering for railway operators** that takes train maintenance to a whole new level.
And with a **portfolio of additional services** that also guarantee the fault-free and efficient operation of vacuum systems in the long term.

One team, one task: Services beyond the norm

Plan, build, commission - and then what? For us, it goes without saying that we will continue to be available to you after a project has been completed - day in and day out, around the clock. After all, technology is developing at breakneck speed, constantly creating new possibilities - and we want you to be able to benefit from this. Each of our international service teams stands for its own core competence, ensuring your 360° support:

CONSULTATION

Troubleshooting in day-to-day operations:
If you encounter a problem or feel that your system could be optimized further, you've come to the right place. We're available 24/7 to address any questions you may have and provide long-term solutions. Whether it's piston or membrane valve technology, whether the systems were installed by us or by third parties, we are here to support you and ensure your system operates at its best.

MAINTENANCE

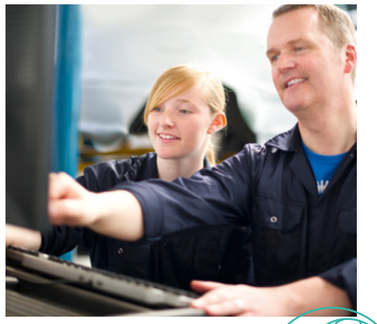
Wisely invested capital:
With a maintenance contract, you ensure that your system undergoes regular inspections to identify any signs of wear before they can lead to significant consequences.

SPARE PARTS

Replace or repair:
You can always rely on our spare parts service. With around 10,000 items in stock, we are able to help you quickly and reliably.

TRAINING

Helping you to help yourself:
Through intensive training sessions, we transfer our knowledge to your employees, empowering them to gain a deep understanding of the system and operate it flawlessly.



MODERNIZATION

Always up to date:
Our systems are designed for a long service life. At the same time, their design also allows them to be upgraded or retrofitted at any time with the latest monitoring options - or simply with the latest generation of vacuum technology.

More information?

Are you interested in our company or would you like to find out more about our solutions?

Then simply contact us by telephone on +49 6181 309-275

By e-mail at info@roediger-vacuum.com

Or visit us online: www.roediger-vacuum.com

SEWER SYSTEMS

The most important facts at a glance

As a system supplier, we support projects from the initial planning stage through to maintenance and spare parts service. Roediger® vacuum sewer systems deliver reliable performance at numerous locations worldwide, spanning developing regions and industrialized countries, metropolises, and sparsely populated areas alike.

Roediger® vacuum sewer systems - the new normal.

Around 7.8 million m³ of wastewater -
transported safely day after day

Around 70,000 house connection chambers worldwide -
supported by our service teams

In over 60 countries around the world -
modern infrastructure and sewer systems for millions of people

44 kilometers long -
is the longest vacuum sewer system from Roediger®, connected to the largest vacuum station in the world

Decades of proven reliability -
proven technology for every project

Smart digital solutions -
monitoring, diagnosis and control of sewer systems

Roediger

A brand of
Aqseptence Group

Roediger Vacuum GmbH

Kinzigheimer Weg 104
63450 Hanau
Phone +49 6181 309-275
E-mail info@roediger-vacuum.com

www.roediger-vacuum.com

SCAN ME