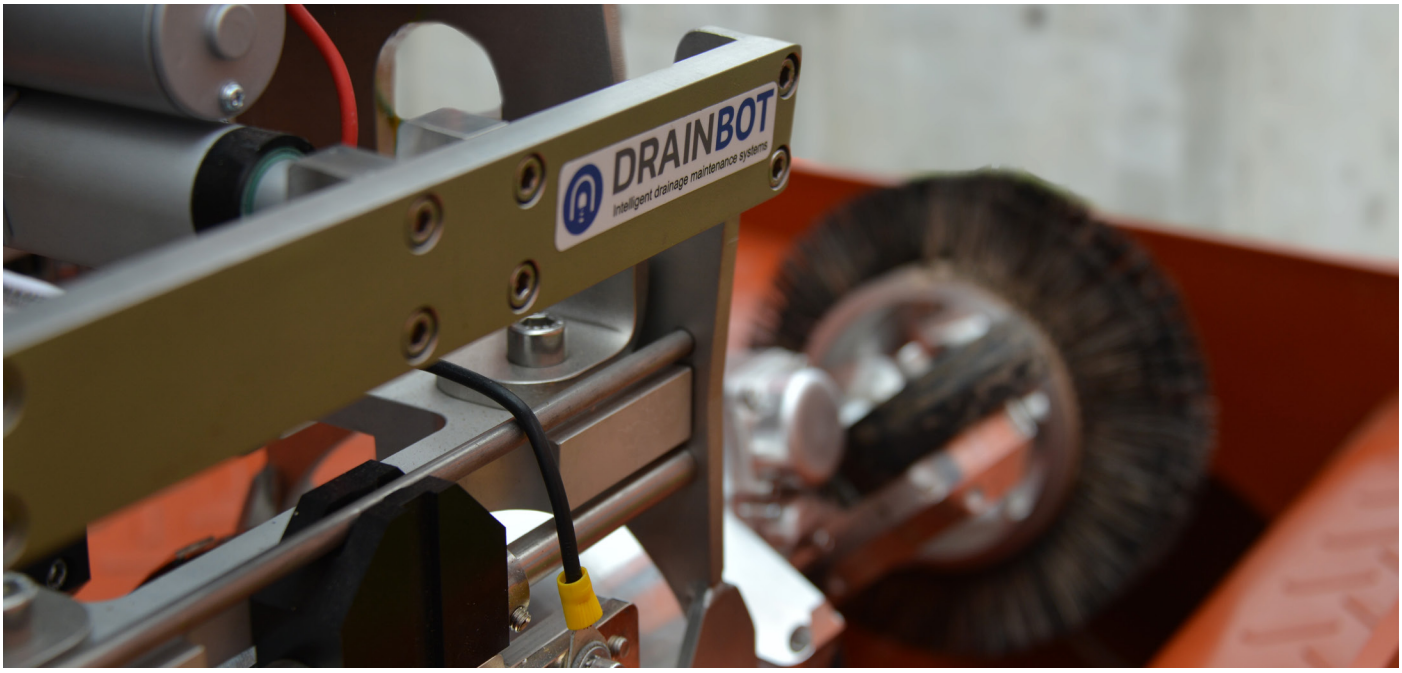
DrainBot

The First Autonomous System for Road and Railway Tunnel Drainage Maintenance



DrainBot is the first autonomous system developed for the maintenance of tunnel drainage. Instead of the dominant water jetting technology, DrainBot applies intelligent robots to allow for removal and preventative maintenance of the drainage pipes.

This smart innovation completely removes the consumption of water from the process. Alsoinstead of using fossil fuels for operating the machinery, DrainBot relies on electricity sourced from a redundant battery system included in the body of the robot. By providing the operator with an autonomous charging system, DrainBot ensures almost permanent operation ultimately enabling preventative and predictive maintenance of the tunnel drainage. In addition, the robotic system collects various data through multiple installed sensors on the robotic body, for a better data analysis and interpretation which enables optimal personalised drainage maintenance.

Strong Foundations

DrainBot GmbH was established in Graz, Austria, in 2019. This is also where all products are developed and manufactured. With the advice and support from the best professionals with decades of experience in engineering, innovation and tunnel

maintenance, the young start-up delivers high-quality products and services for tunnel operators across geographies and sectors. Through partnerships and support of the leaders of innovation in Europe, DrainBot is continuously growing and working on delivering even more value to its existing and future customers.

The novel autonomous robotic system has been primarily created to be used in highway and railway tunnels. Nevertheless, the robotic system can be adapted easily and therefore be used in various other industries such as airports, underground, mining industries and many more.

"This system is the first significant leap in this sector in the last 25 years."
- Manager, Tunnel Operator in DACH

Tunnel Infrastructure – How It Works

Drainage systems in tunnels prevent the accumulation of water and subsequent damage to the structure. As organic and inorganic matter transported with the water builds sediment that reduces the tunnel diameter and efficiency, drainage systems in tunnels are maintained regularly.

DrainBot systems contain one or more robotic units that move through drainage pipes between multiple charging stations. While they move and collect various data, the perforated brush on the robotic unit cleans the walls of the drainage pipe, removing sediments in the flow direction ensuring longer lifetime of the drainage system without any interruptions of the traffic in the tunnel.

- Automated without a human operator
- Data-driven intelligent system
- Modularly extendable
- Unlimited cleaning run length

Unique Product

User Benefits

- <1.000 to/a CO2 emissions
- 0 l/min water consumption
- cost savings of up to 70%
- no locking times

DrainBot is an autonomous robotic system that reduces the cost and environmental impact of maintenance, while also reducing hazards for employees as their time spent in the tunnel is reduced to zero. It improves the profitability of tunnel operation through significant reduction in locking times, benefiting passengers, logistics companies and tunnel operators. Unlike water jetting solutions that use lots of water and heavy machinery, DrainBot uses only the resources in the drainage system.

Robust Hardware

DrainBot is an innovative system that uses an unconventional maintenance technique to improve the efficiency and sustainability of tunnels while reducing the costs and hazards related to drainage maintenance. The robotic unit is designed to withstand the harshest conditions in its operative environment. It is resistant to water, temperature changes, high mineral content, mechanical force and it can operate fully autonomously, making it adaptable for integration and operation.

2 months after water jetting

3 months after DrainBot installation

Value-Generating Data

DrainBot collects data about the status of the drainage in tunnels and uses this information to further optimise its efficiency.

"This way we can not only maintain the tunnel drainage, but also improve the insights we are gathering about its status and changes over time. In addition, collected data allows us to better

predict the maintenance intensity so the optimal status of the drainage can be kept at all times. This generates value not only to DrainBot, but also to our customers as they can always access the status of their tunnel drainage systems remotely, learn from it and optimise their operations based on the analysis we are offering," stated Philipp Lepold, one of the two founders and CEO of DrainBot.

Drainbot Tech for Green

Sustainable Technology

- Sustainable approach to water
- reducing carbon emissions
- increasing resilience of existing and new infrastructure
- responsible consumption and production

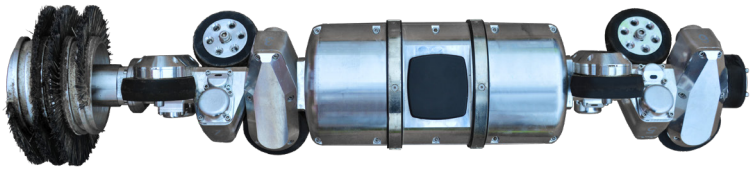
Investing in the Future We stand for:

Efficiency

Our fully automated robotic system is the most efficient and most suitable solution for drainage maintenance in tunnels used for both railway and road transportation.

Sustainability

DrainBot is the only technology on the market that uses only the resources within the drainage system, thereby reducing the environmental footprint of tunnels.



DrainBot robotic unit

Automation

The fully autonomous and robotic system uses a combination of several novel patented technologies and is able to communicate with us remotely at any time.

Innovation

Our innovative solution reduces the demand for resources and costs of drainage maintenance significantly making tunnels more efficient and sustainable.

Project: Zentrum am Berg

Unmatched Efficiency in Removing Sediment

In this project, supported by the European Commission Robotics for Infrastructure Maintenance and Automation programme, the DrainBot system showed unmatched efficiency in removing sediment and maintaining drainage pipe status. While the efficiency seems to vary with the type and the age of sediment and the frequency of maintenance of each single segment of the pipe, our technology offers a long-lasting solution for tunnel operators to reduce locking times while keeping their drainage systems operating at the optimum of their efficiency.

Perception

Our Vision Is Simple

"Our Vision is to enable more efficient, safer and more environment-friendly maintenance of tunnels through novel technologies. By focusing on the tremendous benefits for both the operators of infrastructure and their customers, we will continue to deliver innovative, technology-based, and sustainable solutions for tunnels.", Dr Slaven Stekovic, MBA, one of the two founders of DrainBot and COO/CFO.

Join us in improving the efficiency and safety of tunnels through intelligent, autonomous tunnel drainage maintenance systems for a better future.

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