



Roediger

Innovative Technology for Servicing Trains and Aircraft



Wet Services System

A brand of
Aqseptence Group



Innovative Servicing Solutions





Servicing Trains and Aircraft

– simply more efficient

Air and rail transportation play a significant role in any national transport infrastructure and the provision of reliable, fast and easy-to-operate technology is becoming more important than ever to railway and airport operators. Aqseptence Group provides sustainable and cost-effective solutions for water and wastewater management of train service depots and airports since more than 30 years.

Significant advantages of Roediger® Wet Services System:

- ▶ Quick and reliable
- ▶ Odourless and drip-free
- ▶ Intuitive and easy handling
- ▶ Hygienic and environment-friendly



Aqseptence Group is the world market leader with its Roediger® Wet Services System. We developed drip-free and odourless sewage extraction systems for Deutsche Bahn more than 30 years ago.

The proven Roediger® technology meets the highest hygienic standards of occupational health services of International Railway companies. Our patented system is approved and recommended by the Federal Railway Authority (EBA). Roediger® technology is part of the standard equipment in ICE high speed trains service depots of German Railway (Deutsche Bahn AG) and other Railway companies.

We provide the following solutions and technologies:

- Treatment and recycling of washing water
- Potable water treatment and supply
- Sewage extraction using vacuum technology
- Preparation and supply of flushing water
- Service stations for indoor and outdoor areas
- Controlled emission toilets (CET)
- Cleaning service cabinets for interior cleaning of trains
- Underground pits for airport stands

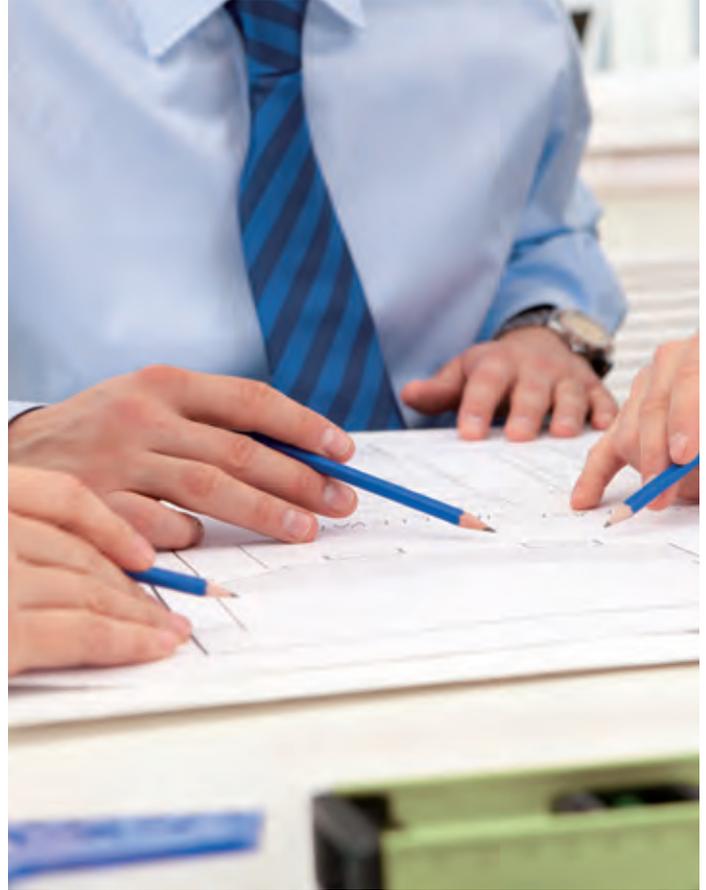
More than 10 years ago we transferred the successful concept to airport applications and provide underfloor solutions with pit systems to service aircrafts at the apron.

Your system supplier for Wet Services

Development and construction
of supply- and disposal systems



Planning and consultation
during the design phase



The Vacuum Technology Product Line of Aqseptence Group represents tradition, progress and innovation. As a dynamic and international Product Line, we can proudly look back to over 175 years of company tradition and as a part of the Aqseptence Group, we are a competent partner for your water and wastewater engineering tasks.

We have been internationally successful in the railway industry since more than 30 years and are the leading supplier of water supply- and sewage extraction systems as well as water management systems for train wash stations.

Our company is certified as per DIN EN 9001, to ensure consistently high quality levels and a continuous improvement of all our processes in all areas. We are a certified contractor per Federal Water Resources Act (WHG), are compliant with the latest European machinery directives and meet the highest German quality standards.

Furthermore, our system and products are in accordance with IATA, ACI and EBA regulations. The Federal Railway Authority (Eisenbahn-Bundesamt) in Germany approved the drip-free and odourless Roediger® system. The system is recommended in the latest EBA administrative regulations.



Roediger® drip-free and odourless extraction pistol

Engineering, procurement and construction (EPC) contracting



Professional service and operation support



As a system supplier and specialist with locations across the globe and local partners in many countries we offer comprehensive and highly efficient solutions and are immediately available for support on site or through remote access.

- ▶ Cost estimation
- ▶ Concept design
- ▶ Detailed planning
- ▶ Construction supervision
- ▶ Operation
- ▶ Maintenance
- ▶ Modification

We offer comprehensive service packages for operation, maintenance and optimisation of our system, subsequent to handing over the completed project.

Our experienced and highly motivated team provides competent and comprehensive services and support to engineering offices, construction companies and local authorities in every phase of a project.

Your project is our passion!



Roediger® automatic train valve

Clean and odourless

– ergonomic, hygienic and sustainable engineering

Roediger® engineering goes hand-in-hand with positive hygienic and environmental components. The extraction of toilet wastewater from high speed trains and other passenger coaches must be drip-free and odourless – as required by occupational health services and most National Railway authorities for hygienic and health reasons.

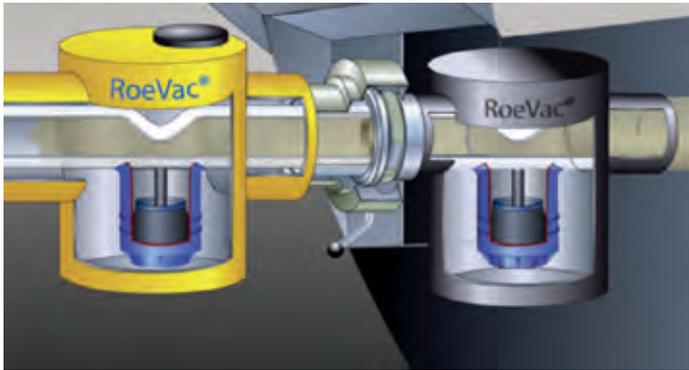


Automatic extraction of toilet wastewater at Deutsche Bahn depot Berlin Rummelsburg

Key components for train service systems:

- ▶ **Roediger® Vacuum Station:**
 - Skid-mounted vacuum stations are delivered pre-assembled and factory tested
 - Separate handling of media:
vacuum pumps for air transportation – forwarding pumps for sewage
 - Large-scale plants with powerful vacuum for large train service depots with individual arrangement of vacuum vessels and M&E equipment
- ▶ **Roediger® Service Cabinets:**
Multi-functional cabinets for wastewater disposal and freshwater supply systems
 - Automatic flushing of freshwater supply system to prevent germ formation
 - Clear separation of wastewater evacuation and freshwater supply components to guarantee hygienic standards
- ▶ **Roediger® Cleaning Service Cabinets:**
For interior cleaning of trains

The Roediger® technology fully complies with these requirements. The combination of patented automatic train valves and extraction pistols provides safety and occupational health for the operators at the workplace.



Roediger® extraction pistol (yellow) in combination with Roediger® train valve

Our technology meets the requirements of the German Protection against Infection Act §72 especially due to the following characteristics:

- Automation of the extraction process
 - Avoidance of misconduct; very beneficial in case of semi-skilled and frequently changing operating personnel
- Absolute drip-free disconnection of the suction hose
 - No safety hazards as the operators do not get any contact with sewage; thus safety hazard of smear infection can be avoided
- Completely odourless extraction process
 - No safety hazard due to inhalation of aerosols

Technical advantages of the Roediger® Extraction System:

Drip-free	No leakage, no waste water spillage and therefore safe for environment and operators, no risk of smear infection
Odourless	Totally closed system, no safety hazard, no inhalation of aerosols
High hygienic standard	In compliance with latest hygiene norms and standards, e.g. the protection against Infection Act of the German Federal Railway Authority*
Efficient	Simultaneous and fully automatic servicing of various coaches by one operator is possible
Easy handling	Intuitive and comfort-able use, trouble-free operation by semi-skilled and frequently changing operators
High reliability	Robust system with redundant components

Roediger® Water Management for train wash stations



Chemical / physical / biological treatment of washing- and flushing water with a high recirculation ratio.



Gravel or bio-filtration



Reverse Osmosis



Dosing



Lamella clarification or dissolved air flotation



Sludge dewaterings

Roediger® De-icing Systems for bogeys



Environment-friendly, reliable and efficient de-icing with hot water

The Roediger® De-icing System for bogeys allows fast and efficient de-icing of rolling stock. Ice and snow are melted by using hot water without chemical additives.

Aqseptence Group designs and configures the location and arrangement of spraying nozzle stations as per requirement and train configuration.

The water is recirculated and continuously treated and re-heated. The excess water from melting ice and snow is automatically collected, treated and discharged to the public sewer. The process is operated automatically and continuously monitored.

Roediger® De-icing Systems can be integrated in new or existing train washing plants.

Roediger® Wet Services System for airports



Sewage/Blue water pit at Bahrain Airport (photo: Cavotec)

According to the "Point of Use" philosophy the following media will be served through underground pit systems to the aircraft:

- Potable water supply
- Blue Water (Flushing Water) supply
- Sewage removal from toilets

The ground operations can be improved to achieve faster turnaround times, reduced CO₂ emissions, improved safety and reduction of accidents on the apron.

- **No requirement of mobile equipment for servicing the aircraft**
- **Reduced congestion of the apron**
- **No air and noise pollution**
- **Reduces operational and maintenance costs**
- **Reduced security and safety issues**
- **Easier access to the aircraft (especially in case of emergency) as the left side of the aircraft is free of vehicles**

Roevac® Vacuum Station



The Roevac® Vacuum Station with odour control units will be located in the central Wet Services Plant Room, which is usually in the Terminal basement or inside a separate technical building. The wastewater from the aircraft is collected in a wastewater vessel and then conveyed with wastewater discharge pumps into the municipal sewer system or to the sewage treatment plant of the airport. Depending on the project requirements the Roediger® portfolio provides a wide range of innovative, cost-effective and customer-oriented solutions – from economic skid-mounted compact stations to large customised plants.

Blue Water System



The wastewater toilet tanks of the aircraft have to be flushed with a disinfectant solution ("blue water"). The preparation of blue water is done by using a concentrate and fresh water.

The concentration for the use of the blue water solution is approximately 2% ratio. The blue water system consists of two chemical batching tanks that work in parallel. The blue water solution is withdrawn from one tank by means of the pressure controlled delivery pumps and then pumped via the underfloor pipeline network in the apron up to the individual pit systems.

Potable Water System



The fresh water vessels on board of the aircraft will be filled with potable water as per WHO standard, airline and local regulations. The required water treatment and conditioning equipment is installed inside the central Wet Services Plant Room, but separated from the sewage collection and treatment room to avoid the risk of contamination. The basic treatment includes disinfection, storage, pressure booster and circulation systems. If required raw or brackish water treatment and chilling of potable water can be provided as well.

Underground Pits



The underground pit system follows the international standards (IATA, ACI) and supports the industry with innovative solutions by providing savings, extra revenues and reducing pollution from aviation. The pop-up pits are located at a minimum distance from aircraft connections points in order to improve system performance and ensure the functionality of all systems.

Preferred solution for ground operators as it is simple to use: Open and connect concept.

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