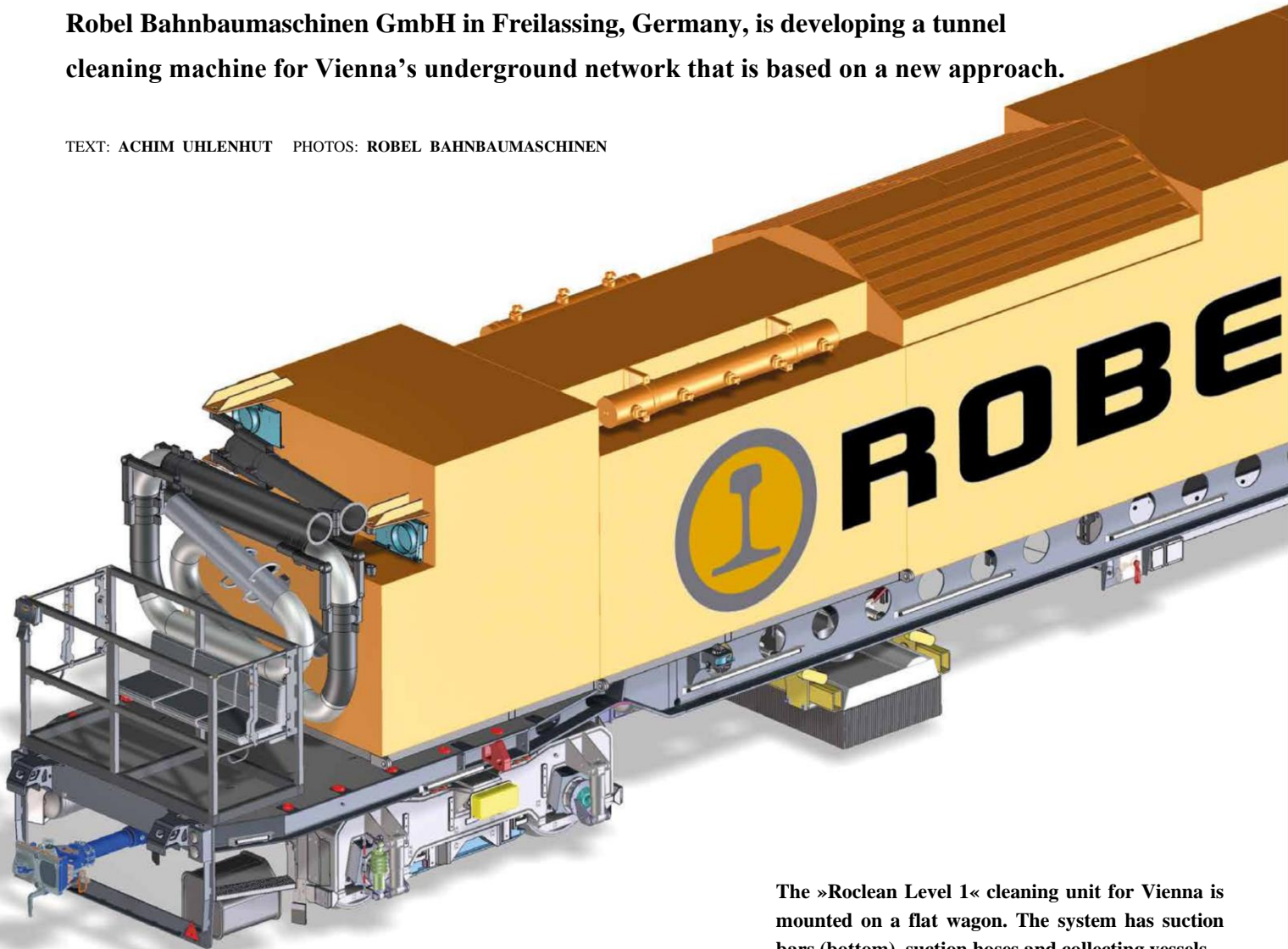


Vienna is cleaning up

Robel Bahnbaumaschinen GmbH in Freilassing, Germany, is developing a tunnel cleaning machine for Vienna's underground network that is based on a new approach.

TEXT: ACHIM UHLENHUT PHOTOS: ROBEL BAHNBAUMASCHINEN



The »Roclean Level 1« cleaning unit for Vienna is mounted on a flat wagon. The system has suction bars (bottom), suction hoses and collecting vessels.

If you search for »Roclean« on the internet, you end up at cleaning detergents and water treatment. There is no mention of tube tunnels and their cleaning (yet). An issue that has been ubiquitous for decades and for which so far a satisfactory solution has not been found: Rubbish, sand, leaves, other contaminants, but also oils, brake dust and the coal particle attrition from the contact between pantographs and electric lines accumulate in urban tunnels. A mixture that is not only visually irritating but also volatile as it may be conductive or even combustible. Anything that is not present in a new tunnel, will have to be removed

later on when it is in operation. At great expense, often done manually, sometimes with the use of machines. In future, this can also be done by "Roclean", the new family of cleaning machines for the track area by Robel.

Working manually and automatically

Following an invitation to tender, Wiener Linien, who operate the underground in Austria's capital Vienna, ordered a cleaning machine from Robel at the end of 2020. It is envisaged to go into operation in summer 2022. Robel will supply a "Roclean Level 1" to Vienna. This machine for the thorough cleaning of the track area is mounted on a flat wagon and has an independent power supply.



Operating at a maximum of two kilometres per hour it allows for manual working with suction hoses and simultaneous automatic cleaning through volume extraction in the “suction bar”. Towed by a suitable traction vehicle, it travels over sections of plain line and through tunnels. To avoid excessive noise, silencers reduce the noise emissions of the suction equipment while fine particulate filters remove 99.9 per cent of the dust particles from the exhaust air. The collecting vessels with a capacity of eleven cubic metres are large enough to take in the extracted material from one or even several shifts, depending on the amount present. Up to three operators will travel the whole of Vienna’s underground network on the machine. Work will be carried out in both directions of travel.

Indeed, there is huge international interest in tunnel cleaning machines for underground and suburban railways. Most recently, the company Schörling-Kommunal from Lower Saxony in Germany supplied a highly specialised allround tunnel cleaning machine to Beijing in 2013 and went on to develop more of this type of machine (see **Regionalverkehr** magazine 3-2014). A contract with London Underground to supply an elaborate three-part cleaning machine that, after extensive preliminary work, was cancelled due to non-payment bankrupted the company. Due to the constant increase in underground railways worldwide and some rapid growth in networks, there is more cleaning requirement than ever before. In view of short possession times and short intervals between train services, it is often impossible to complete the required work manually.

A machine family is being developed

Robel is responding to these requirements with a family of scalable cleaning machines. As the “cleanest solution for the track” it bears the typical Robel name Roclean and is offered in three levels. “Roclean Level 1” is mounted on a transport wagon, Level 2 is a bigger two-part unit, and the Level 3 machine is self-powered with its own traction. The latter is envisaged to provide a high output per kilometre and boast an exciting design. If requested, Robel will also equip the cleaning machines with a special surface cleaning facility that was first introduced in a pilot in 2019. “Roclean Ice” is able to remove layers of graffiti and oil without damaging the basic substance underneath by targeted firing of cryogenic dry ice pellets. The dry ice evaporates as soon as it hits the surface as it consists of pure carbon dioxide. In light of these options, the first machine to be built is the technical market entry into the world of Roclean. For Wiener Linien, who like to refer to themselves as “Greener Linien”, this is an important step towards becoming the “Cleaner Linien” of Vienna’s extensive underground network.

As a result of using the semi-automated cleaning machine, Wiener Linien expect cleaner track areas and in turn significantly better working conditions for the track construction personnel, improved quality for passengers and even a reduced fire risk. Environmental pollution from dirt and oil as well as maintenance costs are expected to fall, both with regard to the ballast bed and the vehicle fleet. Even in performance class 1, the big yellow vacuum cleaner will make this possible, also in corners next to the track that have hitherto been difficult to reach, as the suction hoses at both ends of the wagon can be unrolled by up to 20 metres.

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Operators can unroll separate suction hoses to up to 20 metres and so can reach areas that are otherwise difficult to access, such as recesses and shelters next to the track.