

A large tunnel under construction, showing a cleaning machine and workers. The tunnel is illuminated by bright lights, and the walls are made of concrete. The machine is positioned in the center of the tunnel, and several workers in orange safety gear are visible around it. The floor of the tunnel has two sets of parallel tracks.

Tunnel Dry Cleaning Process

BRÜGGER HTB

Tunnel dry cleaning process

Specialised in railway infrastructure cleaning, with more than 15 years of experience in tunnel cleaning, Brügger HTB GmbH is a family business with tradition and innovation. Our company headquarters are located in Frutigen/Switzerland, a few hundred metres from the north portal of the Lötschberg base tunnel. From many years of experience in tunnel cleaning, we now have great expertise in dry cleaning and the manufacture of suitable machines for this purpose. The primary objective of dry cleaning is to extract the fine dust in the tunnel, which is harmful to railway technology. As a leading company in this field of activity, we are continuously developing new and improved cleaning methods. Our subsidiary Brügger RT AG offers tunnel cleaning machines tailored to specific customer needs.

Your problem - Fine dust and other pollution

Fine dust is produced by the wear and tear of rolling stock. Primarily from the braking systems of the trains. Hardly noticeable at first glance, in practice fine dust can cause enormous damage and disruptions to railway operations. In the tests, vacuuming the fine dust (dry cleaning) qualified as the only solution for efficient cleaning of the tunnels. In the temperature range of over 40 degrees Celsius, units with special cooling systems are indispensable. The conditions in tunnel cleaning are extreme and place high demands on people and technology.



Picture: Fine dust cleaning Subway tunnel Berlin DE

Our solution - The Cleaning train

Different modules clean the tunnel in the following steps: vault, side walls, bench and rail bed. With our cleaning train, a clean and efficient overall cleaning is guaranteed. The economic aspect is of great importance. In this case, it is important to reopen the tunnel sections to be cleaned for railway operations as quickly as possible. To make the cleaning even more efficient, we have also developed a speed cleaning backup, which allows us to clean at speeds of up to 10 km/h.



Picture: Cleaning train Lötschberg base tunnel south portal



Picture: Cleaning machine for narrow tunnel caverns

Cleaning machines

With the successful cleaning in long-distance tunnels, several railway operators at home and abroad became aware of our dry cleaning process. The enquiries show that there is a cleaning backlog in most railway tunnels. In many places in underground stations and underground networks, the pollution is enormous. This leads to technical malfunctions, breakdowns, fires and massively reduces the service life of the infrastructure. The acute need for action in many places and the concrete requests from several railway operators have prompted us to standardise and patent our system.

The equipment and vehicles we have used to date are mounted as individual units on Rola wagons (Rola: abbreviation for Rolling Road in German). Setting up the system and operating it requires experienced machinists and technicians. We are currently developing an optimised and compact machine that we can produce in series. A central operation and its own undercarriage should make the machine a tunnel cleaning system that is quickly ready for use and easy to operate. The patented system of cleaning with blow-off and suction will also be used on the new machines. The dimensions of the new machines will be kept as small as possible so that the cleaning trains can also clean in tunnels with smaller vaults. With these machines we want to create new standards for cleanliness in the railway infrastructure. The subsidiary Brügger RT AG was founded in 2017 specifically for the development and production of new cleaning equipment. Since 2022, we have been certified for the welding of rail vehicles and vehicle parts.

References



Lötschberg Base Tunnel

We regularly clean the 34.6 km long Lötschberg Base Tunnel (Frutigen-Raron 1 tube 34.6 km) using the dry cleaning process developed by us. Cleanliness in the cross passages, ventilation tunnels and technical rooms also falls within our remit.

Gotthard Base Tunnel

Cleaning in the Gotthard Base Tunnel (two tubes, 57 km each) has presented us with new challenges. The different construction method of the tunnel and the enormous length in the longest railway tunnel in the world demand new engineering services. We have adapted our existing systems and, to a large extent, developed completely new units. We successfully carried out the construction and final cleaning in the Gotthard, and since 2018 we have also been successfully carrying out the periodic cleaning of the entire tunnel.

Other references

Subway Tunnel Berlin DE | Top of Europe - Jungfrauoch CH | Ceneri Base Tunnel CH

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