

Filtration Group Application Example – Air Filtration

Clear Edge CFE Filterplate in Tunnelworking



Factory Equipment

Initial situation

Tunnel construction by machine driving is carried out, for example, with the aid of a tunnel boring machine. These machines differentiate between full-cut machines, with which the entire working face is machined at once, and roadheaders, which work with rotating or oscillating drilling systems. In order to prevent the escaping drilling material from producing any emissions, it must be collected and separated by suction. Our customer's task was to develop a filter element for a dry drilling material extraction system in order to prevent the generation of emissions by the escaping drilling material.

Solution statement

In order to prevent emissions from escaping, our customer developed the powerful dry drilling material extraction technology. The core of this innovative and patented solution is a highly effective rotary piston blower for generating negative pressure. In combination with a compact element filter, compliance with the prescribed limit values is achieved. Due to the cramped spatial conditions, the exchange of parts is connected with an immense time and financial expenditure. A reliable service life of the compact filter elements is therefore a basic requirement. Last but not least, the use under complicated environmental conditions requires a high regeneration capacity of the compact filter elements in order to cope with large volume flows in compact housings. The compact filter elements from Clear Edge combine the requirements of an extremely solid construction as well as innovative and extremely resilient filter media with the highest possible efficiency.

Customer value

- Reliable service life of the compact filter elements
- Underground use requires a high level of regenerative performance in order to cope with high volume flow rates in compact housings
- Compact filter elements incorporate the requirements for sturdy construction within the extremely resilient filter media, and they provide the maximum possible level of efficiency
- Professional solution for the environment and work safety



Challenge

The legal rules governing underground working are especially strict. For instance, in Germany the applicable MAC value for general dust is currently 3.0 mg/m³. The use of dust removal equipment for tunnel construction therefore provides advantages in many areas. Firstly, a pleasant and clean atmosphere and working environment is created for the workforce and the work machines, and secondly all the legally specified MAC values in the field of health and safety and environmental protection are complied with through the use of CFETM compact filter elements.

Types of tunnel-boring machines

Full face boring machines are moved using advancing assemblies. While the rock is removed, the machine is braced into the surrounding ground with clamps.

Sectional cut heading machines always operate on only a relatively small area of the bore profile. Since the cutting and extraction tools are fitted on a swiveling boom, the machine can work the cutting face continuously.



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