

***aigner***<sup>®</sup>

T U N N E L   T E C H N O L O G Y



## ECCO *AIRJET*

The world's most advanced  
tunnel filtration system



[www.aigner-tunnel-airjet.com](http://www.aigner-tunnel-airjet.com)

TUNNELS FOR THE FUTURE  
**CLEAN & SAFE**

“**ECCO**AIRJET** is the most amazing development in tunnel filtration history**”

*“I have been developing the most modern tunnel filtration systems together with my team since 1980. The all new Aigner ECCO**AIRJET** is a technological milestone and the beginning of a completely new age. ECCO**AIRJET** has no weaknesses, is best in class concerning efficiency, safety, protection of nature and operation/maintenance ... and is even less expensive than traditional filtration systems.*

*I am proud to be a part of my great team!”*

*Ing. Heinz Aigner*

CEO Aigner Tunnel Technology GmbH



## MAIN WEAKNESSES OF TRADITIONAL ESP PLANTS

### ESP PROBLEM #1 HIGH VOLTAGE



Traditional Electrostatic Precipitators (ESP) require high voltage to work. For this reason short circuits and other high voltage issues cannot be avoided. Thus highly qualified and experienced technicians are needed!

### ESP PROBLEM #2 WET CLEANING



ESP filters need to be washed regularly, which requires fresh water and water treatment plants. As a result waste water is produced. After washing the drying process starts. Switching on high voltage can cause sparking in EP cell.

### ESP PROBLEM #3 MAINTENANCE



During maintenance of ESP filters the filtration plant has to be stopped. This can add up to approximately 14 days per year. In addition cost-intensive and complicated technical equipment is necessary to maintain such filters.

## THE BEGINNING OF A NEW AGE



### TRADITIONAL ESP TECHNOLOGY

Since many years tunnel projects have been equipped with Electrostatic Precipitators (ESP) plants, mainly because of environmental protection. Nevertheless ESP filtration systems have well-known weaknesses which can't be avoided: dealing with high voltage, dangerous and complex maintenance, high risk of damages and failures due to high voltage, no 24/7 operation, etc.

### NEW MECHANICAL TECHNOLOGY

With more than 40 years of experience we are fully aware of all ESP-weaknesses. For this reason we developed a completely new filtration system with huge advantages like better efficiency, easier maintenance, fewer environmental pollution and many others. In 2019 we proudly launched ECCO**AIRJET** – the next milestone and the beginning of a new age in tunnel filtration technology.

## FILTRATION SYSTEM

### STEP 1 COLLECTING DUST PARTICLES

Polluted air of road tunnels need to be cleaned to protect citizens around shafts and protect our nature. ECCO**AIRJET** is the best tunnel filtration system worldwide and collects all particles – even ultra fine ones with less than 1 micron.

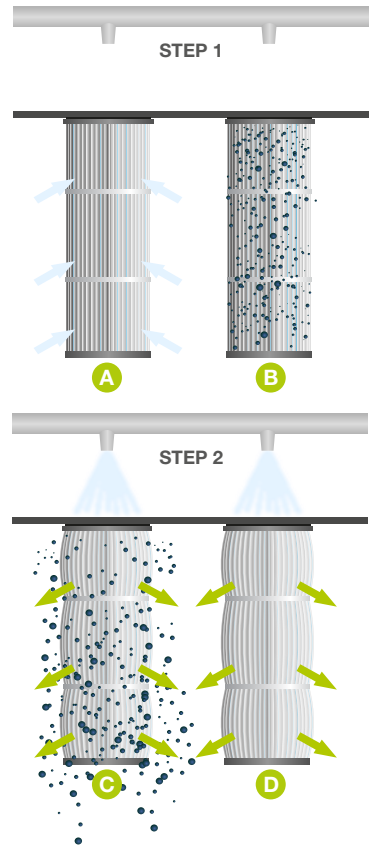
Figure (A) shows the airflow through a filter cartridge of an ECCO**AIRJET**, equipped with different filter medias for best filtration performance. As shown on filter (B), dust particles are collected mechanically by ECCO**AIRJET** filtration system.

### STEP 2 CLEANING WITH COMPRESSED AIR

The dry cleaning process of ECCO**AIRJET** is unbelievable simple and safe and is operating fully automatically.

Solenoid valves controlled by an intelligent software pulses with compressed air and dust is effectively blown off of the filter cartridge (C), ending up in a clean filter again (D).

This process happens during operation of the filtration plant.



## MAIN ADVANTAGES OF ECCO**AIRJET**

- 1 NO HIGH VOLTAGE**  
No high voltage and no sparking in ESP cells. No problems with high voltage equipment and insulators.
- 2 DRY CLEANING DURING OPERATION**  
Cleaning system with compressed air with automatic controller. 24 hours per day / 7 days per week.
- 3 HIGH EFFICIENCY**  
> 99 % for all particle sizes! Even ultra fine particles smaller than 1 micron.



- 4 OPERATION & MAINTENANCE**  
Easy and safe! No problems with high voltage, no stop of filtration plant for cleaning, no water treatment. Plug and play waste disposal. No technical experts needed.
- 5 MODULAR FILTRATION SYSTEM**  
Allows simple expanding and stacking both horizontally and vertically.



## HUGE COST ADVANTAGES BEST PRICE



### ● Investment Phase

ECCOAIRJET itself is more advanced and therefore a bit more expensive than traditional ESP filtration technology. But keeping an eye on expensive equipment not needed (e.g. for high voltage, water treatment, ...) ECCOAIRJET offers a massive cost advantage of 10 %!

### ● Ongoing Operation

Comparing ongoing costs of daily operation, ECCOAIRJET filtration systems are on a similar price-level than traditional Electrostatic filtration systems.

### ● Regular Maintenance

Taking costs caused by maintenance into consideration, the advantage of ECCOAIRJET becomes even bigger! ECCOAIRJET helps saving 85 % on a yearly basis compared to ESP filtration technology.



## MIND-BLOWING HIGH EFFICIENCY



### ● Efficiency > 99 %

Almost all particles are less than 1 micron. ECCOAIRJET has an efficiency of 99 % for all particle sizes, even for PM1.0 particles.

### ● No Pre-Filter

To protect Electrostatic Precipitators (ESP) of large particles, pre-filters are used. ECCOAIRJET does not need pre-filters at all and can handle all sizes of particles.

### ● Airflow Distribution

Using ECCOAIRJET filtration system the airflow of the polluted air distributes itself in a natural and optimal way. No guide vanes needed!



## EASY & FAST MAINTENANCE SMOOTH OPERATION



### ● Dry Cleaning System

ESP need water and water treatment plants. ECCOAIRJET is cleaned by compressed air only - simple and safe! One of ECCOAIRJET's biggest advantages!

### ● 24/7 Operation

The dry cleaning system is working during operation! No stop of the filtration plant is necessary, no drying after washing filters like in an ESP plant.

### ● Time Saving Maintenance

ECCOAIRJET requires 1 to 2 days per year for maintenance only. Check of valves and filter media is all that needs to be done!

### ● Easy Waste Disposal

In a central dust filter all particles are collected in dust bins. Replacing bins is a matter of minutes - plug and play in perfection.



### ● Basic Level Technicians

Traditional ESP filtration technology requires best qualified and experienced technicians - hard to find all over the world. Maintaining ECCOAIRJET is easy and can be executed with basic level knowledge!

## ULTIMATE GREEN TECHNOLOGY PROTECTING NATURE



### ● No Waste Water

ECCOAIRJET's dry cleaning system is saving a massive amount of clean water year after year. This is one of the best investments in keeping our planet healthy.

### ● No Water Treatment

No water treatment equipment is needed for cleaning purposes: no water pumps, no water recycling systems, no disposal of polluted water.

### ● No Ozone Production

ECCOAIRJET filtration system does not produce ozone at all, while Electrostatic Precipitator (ESP) plants do.

## SIMPLE TECHNOLOGY NO HIGH VOLTAGE



### ● No High Voltage

Due to its mechanical mode of operation ECCOAIRJET does not need high voltage, thus it's safe and secure!

### ● No High Voltage Insulators

Thousands of them are a weak point of an ESP plant. Insulators can be damaged by leakage current of high voltage.

### ● No Short Circuits

ECCOAIRJET is working with no voltage at all. Compared with ESP no sparking after washing arises - and no damaged high voltage insulators.





ESP FILTER VS. MECHANICAL FILTER



ECCO EP quattro



ECCO AIRJET

1. EFFICIENCY

Efficiency	80 - 90 % <input type="checkbox"/>	> 99 % <input checked="" type="checkbox"/>
Pre-Filter	Required <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Airflow	Guide vanes needed <input type="checkbox"/>	No guide vanes <input checked="" type="checkbox"/>

2. VOLTAGE

High Voltage	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Insulators	Thousands <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Short-Circuits	Not to avoid <input type="checkbox"/>	Never <input checked="" type="checkbox"/>

3. OPERATION

Cleaning	Wet cleaning <input type="checkbox"/>	Dry cleaning <input checked="" type="checkbox"/>
Cleaning Cycle	Weekly <input type="checkbox"/>	During operation <input checked="" type="checkbox"/>
Waste Disposal	Mud cake <input type="checkbox"/>	Dust bins <input checked="" type="checkbox"/>
Know How	Expert <input type="checkbox"/>	Basic <input checked="" type="checkbox"/>

4. NATURE

Water Recycling	Necessary <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Water Treatment	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Ozone	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

5. PRICE

Investment	Full price <input type="checkbox"/>	10 % lower <input checked="" type="checkbox"/>
Operation	Similar <input type="checkbox"/>	Similar <input checked="" type="checkbox"/>
Maintenance	Full price <input type="checkbox"/>	85 % lower <input checked="" type="checkbox"/>

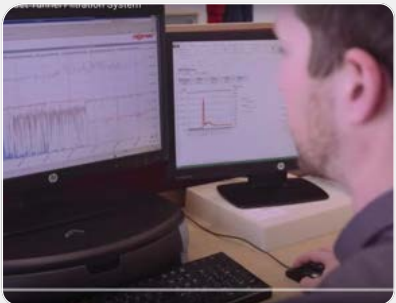


WHY WE ARE INDUSTRY LEADERS ...  
40+ YEARS OF EXPERIENCE

Aigner Tunnel Technology GmbH is situated in Austria and is well-known in its industry all over the world. Aigner Tunnel Technology GmbH has been specializing on the development and construction of industry-leading tunnel filtration systems since 1980.



TUNNEL TECHNOLOGY





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*State of the art: June 2020*