

Clean air in highly frequented areas

THE CHALLENGE – POLLUTED AIR IN UNDERGROUND TRAIN STATIONS

Worldwide, many cities struggle with air pollution, as traffic and industries produce high concentrations of particulate matter and harmful gases. Especially in high traffic areas or places with large emissions and low air exchange, the exposure is high and the effect on human health is harmful. This applies, for example, to busy streets and in particular to subway stations where air exchange is usually poor.

Track abrasion and brake dust is stirred up by incoming trains and fills the air. People with respiratory illnesses, the elderly or children should not be exposed to high concentrations of particulate matter or other air pollutants. Surrounding yourself with clean air is a quality of life necessity.

FINE DUST IS A HEALTH RISK



Inhalable Dust Particles

Particle diameter $> 10 \mu\text{m}$
penetrates the nasopharynx
and trachea

Fine Dust PM 10

Particle diameter $\leq 10 \mu\text{m}$
enters into the lungs/bronchial
tubes

Fine Dust PM 2.5

Particle diameter $\leq 2.5 \mu\text{m}$
invades the deepest parts
of the lung

Fine Dust PM 1

Particle diameter $\leq 1 \mu\text{m}$
enters into the bloodstream

MORE THAN 80 YEARS OF EXPERIENCE IN FILTRATION

MANN+HUMMEL knows its way around the purification of air and liquids. For many decades now, it has been a top company in designing filters used in vehicles and buildings. Now we are using our "Filtration know-how" to reduce the amount of air pollution in particularly affected areas. The intelligent filtration technology reduces the pollution

levels on site and thus contributes to the protection of human health. The concentration of particulate matter can be scaled down through the filter columns directly at all kinds of pollution hot spots and wherever people long to breath freely.

THE SOLUTION – FILTER SQUARE PROVIDES CLEAN AIR

Within the Public Air Solutions technology platform, MANN+HUMMEL has developed so called Filter Squares which are especially tailored for use in underground stations. The heart of the air purifiers is installed directly in front of the low-noise radial fan: a large-area, highly effective particle filter. The constantly improved filter achieves an operational efficiency of up to 80% finedust capturing from the drawn-in air. And yet, the design of the filter media still allows a particularly high air throughput, which lowers considerably the energy required to clean the air. One Filter Square purifies up to 3,600 m³ of air per hour, the Filter Square II even up to 7,200 m³/h.

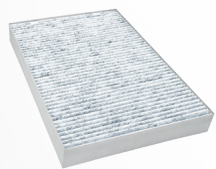


WIDE RANGE OF FILTER MEDIA

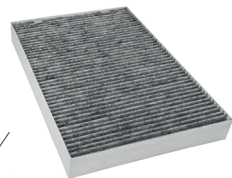
Depending on requirements and installation site, different filter media can be inserted into the Filter Squares. If it is purely a question of reducing particulate matter which are over the limit, highly efficient particle filters are used.

In areas where the reduction of NO₂ is also required combi-filters should be used. They are equipped with a filter layer for particles and activated carbon layers that adsorb NO₂. Through its large surface, this extremely porous activated carbon-media is highly efficient in capturing the harmful gas.

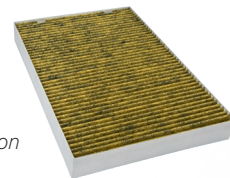
Filters with FreciousComfort technology offer not only protection against particulate matter and NO₂ but they are also an effective defence against free allergens and microbial growth. A special anti-allergenic and anti-microbial coating on the particle filter prevents the growth of micro-organisms like bacteria, mold or fungi and inactivates free allergens.



*Particulate Matter Filter/
Fine Dust Particle Filter*



*Combi-filter with premium
activated carbon layer for
NO₂ adsorption and filtration
of particulate matter*



*FreciousComfort Combi-filter
with additional biofunctional
coating – anti-allergic and
antimicrobial*

VARIOUS DESIGN OPTIONS AND CUSTOMIZABLE APPLICATIONS AVAILABLE



Several freestanding Filter Squares in a subway station – as solo version and stacked as Filter Square II.

The Filter Square technology is customizable and available in different variants: It is offered as stand-alone application for semi-open and closed areas (e.g. subway stations). At pollution hotspots multiple air purifiers can be placed or also be stacked on top of each other.

In addition, the technology can also be integrated into billboards for bus stop shelters or train stations. Or in any other custom-built designs and available infrastructure to suit given space and functional requirements.