

# BIO-AIR FILTER

Continuously sanitized, certified air  
for large buildings



The BIO-AIR filter is an advanced **continuous cycle sanitation system, modular for AHU** that finds its place in all buildings with closed environments where there is a centralized HVAC system.

It uses an **innovative method for sanitizing the air** with particular attention to the **safety of people**, avoiding the use of technologies that are harmful to health.

TONALI E.A. presents an innovative filter BIO-AIR for continuous cycle air sanitation in large buildings based on technology Phoebe® owned by company Colorobbia Consulting a company of cutting-edge innovation in research of ceramic materials and plastic models.

After an intense period of research and many hours of testing at the most established laboratories, TONALI E.A. proposes BIO-AIR technology, the effective, safe and certified solution for the abatement of viruses, bacteria and polluting gases.

The BIO-AIR modular filter, inserted in centralized AHU systems, works 24 hours a day. Lightweight, easy to install and with low maintenance costs



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Energia & Ambiente

# Advantages of the BIO-AIR filter

## Viruses and bacteria real elimination

- not simple mechanical capture (HEPA filters): the devitalized organic material is transformed into harmless substances

## Continuous reduction of volatile gases

- VOC/COV according to international parameters (LEED-WELL)

## Can be used also when people are present

- no risk to people from the technology used

## Certified effectiveness

- according to international standards in situations totally overlapping to the real operating conditions of a normally crowded environment

## Easy installation

- thanks to the standard sizes used and the hooking system to the air passage section

## Low energy costs

- both for the consumption of the LEDs and for the low pressure drop of the filter <100 Pa

## Low maintenance costs

- the filter elements must be replaced every 6-12 months according to the working hours of the AHU

## Low weight

- thanks to the use of light plastic materials

## Low disposal costs

- the replaced materials are not considered hazardous waste and are therefore disposed of in the same way as normal plastic

## No type of additional costs for building or electrical works

## Quick times to guarantee the sanitation of the environments

## Control of air quality parameters

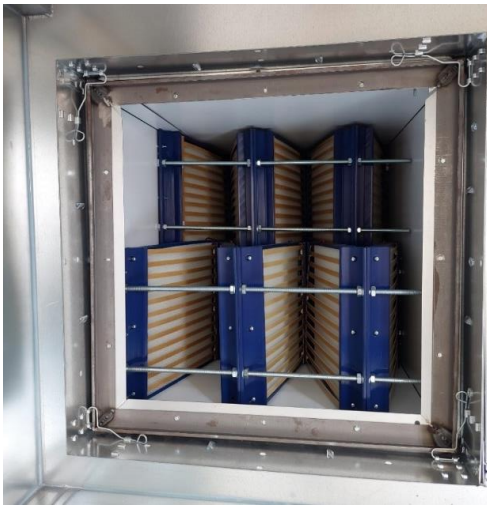
- possibility of integrating the filter with a monitoring system for the control of air quality parameters, correct operation, energy consumption and hours actually worked (**predictive maintenance**).



# The system: how it was born and how it works

TONALI E.A. has designed and developed the BIO-AIR filter using the Phoebe® technology of Colorobbia Consulting. This filter designed for AHUs has insertion characteristics such as to occupy the entire space useful in the HVAC section and at the same time possesses characteristics of lightness of construction and ease of installation.

Tonali E.A. has also tested and certified that the filter load share was low enough (<100Pa) not to impact the performance of the original aeraulic system.



Filter holder counter frame with locking springs for corrugated G4 prefilter



BIO-AIR filter in operation

For the realization of this filter, special LEDs have been chosen (to induce photocatalysis) which guarantee the lowest energy consumption. Innovative plastic materials have been selected which, in addition to the aforementioned characteristics of lightness and flexibility of installation, ensure high industrial circularity and maximum reduction of environmental impact with ease of disposal.

Colorobbia Consulting has **certified the virucidal, bactericidal and anti-pollution action using European Certification Institutes**, some of which adopt the even more stringent American parameters (ASTM, EPA).

The technology Phoebe® induces photocatalysis (virucidal, bactericidal and anti-pollution process) by irradiating white light (above 400nm and therefore not producing ozone) on innovative materials treated with **titanium dioxide**.

In addition to the virucidal, bactericidal and anti-pollution action, the presence of volatile gases (VOC/COV) is continuously reduced according to international parameters (Well-Leed), as well as the PM (2.5 and 10) are retained in the special pre-filters to avoid their vehiculation of pathogens. It is in fact known that PMs are considered to be like virus "buses".

Tonali E.A. focusing on new technologies and innovative materials, it has created a product that is easy to manage and position in the HVAC sectors, which at the same time avoids the expensive VMC and sanitizes the internal environments in a very short time.

# Details and certifications

Regulatory references EN 1822 – ISO 17025	MODEL 1 305 x 610 x 640 mm	MODEL 2 610 x 610 x 640 mm
Air flow at 2,75 m/s	1785 mc/h	3570 mc/h
Initial and final pressure drop	68 Pa	68 Pa
Air flow at 3.0 m/s	2000 mc/h	4000 mc/h
Initial and final pressure drop	85 Pa	85 Pa
Air flow at 3,5 m/s	2250 mc/h	4500 mc/h
Initial and final pressure drop	100 Pa	100 Pa

The BIO-AIR filter has been designed to be inserted in the A.H.U just like all the other standard filters used in the HVAC sector and is manufactured in two different sizes:

- 610 x 610 x 670 mm (depth) on standard galvanized steel counter frame
- 305 x 305 x 670 mm (depth) on standard galvanized steel counter frame

With this modularity the filter can be used both on A.H.U. of new construction than on most of the existing ones.

The power supply of the LED lights is entrusted to 4 drivers of adequate power capable of supplying 12V in direct current for about 30,000 hours.

The BIO-AIR filters have to be equipped with a dust protection prefilter (like a standard G4) inserted upstream in the same counter frame..

## MAINTENANCE

Filter maintenance is scheduled every 6 months and the filter elements can be replaced to reuse the entire remaining part of the filter (casing, frames and LED lights with power supplies). BIO-AIR **can be integrated with a sophisticated monitoring system for controlling air quality parameters**, its correct functioning, energy consumption and the hours of effective virucidal, bactericidal and anti-pollution action (predictive maintenance).

## DISPOSAL

The filters are disposed of in incinerators or can be disposed of in a municipal waste landfill as for ordinary plastic.

## CERTIFICATED OBTAINED BY COLOROBBIA CONSULTING

EUROFINS BIOLAB srl

- Escherichia coli abatement analysis dispersed in aerosol of a glovebox. Abatement = 99%
- CORONAVIRUS abatement analysis deposited on the filter inside the glovebox. Abatement  $\geq$  99.9%

BIOCHEME LAB srl

- VOC (Volatile Organic Compounds) abatement analysis inside a glovebox. In all cases, the tested VOC pollutant is reduced
- Analysis of total microbial load reduction in the office for common use. With the active Phoebe® system, the elimination of the presence of microorganisms is detected
- Analysis of ozone production in the office common use. By not using UV lights, the absence of ozone production by the Phoebe® system was confirmed

Colorobbia Consulting internal laboratory Ce.Ri.Col.

- NO (nitrogen monoxide) abatement analysis inside a glovebox. In the presence of an active Phoebe® system, the NO is completely knocked down

## AIRMID HEALTH GROUP LTD

- Analysis of MS2 bacteriophage abatement in a single pass with filter crossing air speed typical of AHU systems



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