EXECUTIVE SUMMARY

- confidential -

Company Overview

Over born in 2012 as a spin-off from Sapienza University of Rome with the goal to create the most advanced system for energy management for buildings. In 2015 the company entered the banking sector becaming in a while the market leader in Italy with 6.300+ installation and an average energy saving achievement of about 15%. In 2019 the company decided to enter the Air Quality Management market by introducing its sensing technology first and consequently its own no-filter purification technology (so called Crossfield) achieving also the goal to become the first automation company offering an air-quality management solution connected to an energy management system.

The company benefit of a full-stack R&D department recognized in Italy as a national excellence which grant the company a leading position for innovation in its market area.

The company has today 100+ employees in its offices based Rome, Milan, London and Dubai. The Rome headquarter is dedicated to administration and SW R&D activities, the Milan innovation center is dedicated to control-room services, sales activities and HW R&D. London and Dubai offices have a commercial role covering the whole UK/north Europe and GCC areas.

Company turnover has experienced a CAGR 2017 – 2021 larger than 40% and an expected consolidated turnover in 2022 of about 10M€+.

Over operate in the B2B sector with the Over brand and in the B2C sector with the AirFrame brand.

Product Portfolio

The product portfolio is composed of three product families:

- *Building Management System (BMS)*
- *Air Quality Management System (AQMS)*
- *Energy Management SW*.

Most relevant products of the BMS family are the following:

- OBox: a smart gateway with an internal business logic capable to manage all the field devices keeping them connected to the cloud and the energy management SW;
- OMeter: an integrated I/O metered device capable to manage up to 8 single phase loads and 16 inputs;
- NanOMeter: an integrated I/O device capable to manage a three-phase load by using external standard current transformers.

Most relevant products of the AQMS family are the following:

- OSensor: an air quality management sensor capable to measure temperature, relative humidity, CO2, CO, PM1, PM2.5, PM10, VOC, Formaldehyde, Air Pressure;
- AirFlow: a no-filter air purification system capable to manage 230 CBM/h ensuring 99.9% elimination of virus, bateria and mold, better performance of HEPA-filter against dust and sensing technology (temperature, humidity, CO2, PM1, PM 2.5, PM10). The advanced filtering technology named Crossfield™ has a patend pending and is available for the B2C market under the brand AirFrame.

Most relevant product of the Energy Management SW family is the following:

- OverBoard: an energy management software capable to handle thousands of buildings in a single interface allowing the user to navigate historical data on a time series base offering also the possibility to drill-down up to the single sensor installed. The software has also control capability offering the user the possibility to modify the way the building is consuming energy with an intuitive rule engine.

Full product portfolio is available here: https://www.overtechnologies.com/products/

Crossfiled-based device focus

According to Yahoo Finance Crossfield™ is the defined as the “world most effective air purification system” (https://cutt.ly/YKtF0aE). Crossfield™ filtering technology is based on a particular composition of an elettrostatic field and an electromagnetic field implemented by an elettrostatic precipitator and a UVC LED light. The special combination of the two fields create a third-effect so called Crossfield™which exploit a side-effect temporarily created by the exposition to the elettrostatic field of every pathogen to maximize the effectiveness of the UVC light without generating ozone.

The Crossfield™ effect was discovered by Over in August 2021 during some experiment performed on the elettrostatic precipitator filter of the AirFlow device. The existsance and the effectiveness of the effect was tested and certified by accredited laboratories and confirmed by Insubria University. The effect was then object of a patent deposited in October 2021, patent procedure are still running, once obtained the patent will be extended globally.

AirFlow and AirFrame devices were then fully re-designed to maximize the Crossfield™effect, both the devices were launched in January 2022 on the Italian and UK markets.

The company has recently spent R&D effort to re-design the high-voltage transformer required to generate the Crossfield™effect to allow to embed it into a standard air-handling-unit filter cartridge

with the goal to enlarge the Crossfield™technology application to the ducted systems as a future development.

Crossfield™filtering technology is today available for the B2B and B2C sector embedded into the AirFlow (https://www.overtechnologies.com/airflow-air-purifier/) and AirFrame (https://www.airframestore.com) devices sold under the Over and theAirFrame brands.

Over Interest for the Foreign Markets

Thanks to the pandemic a raising attention to the air quality management is registered on a global scale with an observed market growing of 50% in 2020. AirFrame represents a scalable, easy-to-sell device with outstanding performance which justify a premium positioning of the product.

Over is now looking at creating a global network of partners to sell the AirFrame product on a global scale. The terms of cooperation with the identified partners can be based on one of the following schemas:

- Local distributor: in this schema Over will be in charge to manufacture the product handling all the logistic and the potential local production and certification, the partner will be in charge to ensure a given amount of device sold every year in the assigned country according to a plan to be negotiated. In this scenario the partner buy the product from Over on a fixed price reselling it to the local market with a price which must be agreed among the parties according to a market study which must be prepared by the partner.
- Local licensee:in this schema Over will license the the product to the partner which will be in charge to ensure the manufacturing and the sales of a given amount of product every year according to a plan to be negoziated. In this scenario the parties agree on a royalty having a fixed amount plus a variable one based on actual production. Over will support the partner by ensuring the presence of at least a member its technical team to support the local production and to ensure the quality of it in compliance to the one produced by Over. Market selling price which must be agreed among the parties according to a market study which must be prepared by the partner.

All the partnering schema are negoziated on a country-wide exclusivity base.

Ideal partner profile

The ideal partner should have a remarkable knowledge in the field of air quality management/ HVAC system. It should have a proven experience in premium consumer good distribution and positioning, possibly having also a clear track-record in communication expertise. Since the pandemic has raised the attention of hospitals and public health systems, potential partner active in this field are also welcomed.

There are no restrictions to partner not having manufacturing capabilities, however, potential partners interested to apply a local license schema are preferred if the accessible market size is relevant (e.g. over 10.000pcs/year sold).

FILTER-FREE AIR PURIFIER

- 99,9% OF EFFICACY AGAINST DUST, VIRUS, BACTERIA, MOLD AND FUNGI
- CROSSFIELD TECHNOLOGY
- FILTER-FREE
- SUSTAINABLE
- ZERO-WASTE
- REAL-TIME AIR QUALITY MONITORING
- OPERATE SILENTLY AT ALL SPEEDS
- SMART CONTROL
- EASY TO INSTALL
- DESIGNED AND PRODUCED IN ITALY

RoHS CE UKCA

AirFrame is iconically mastered by Italians.
A sustainable, filter-free, air purification system.

Designed in Italy, but made for the world, AirFrame truly embodies Italian craftsmanship. From thoughtful and elegant design aesthetics to app enabled device monitoring and control, AirFrame uses ultramodern technology, Crossfield, so you will finally be able to breathe freely like never before.

DATA SHEET

MODEL	AirFrame
COMPLIANCE	RoHS, CE, UKCA, UNI EN 11254:2007, ISO 15714:2019
DIMENSIONS	82x52x12,5cm
WEIGHT	12 kg
POWER SUPPLY	Single-Phase, 110V/60Hz, 230V/50Hz
CADR (Clean air delivery rate)	230 m^3/h
ACTUAL COVERAGE RECOMMENDED	Up to 80 sqm
SPEED	Auto, Boost & Eco
SOUND LEVELS	Lowest speed - 37 dBa | Maximum speed - 65 dBa
DUST COLLECTION METHOD	Electrostatic filter (ESP)
FILTER EFFICIENCY	99,9% efficiency against dust, virus and bacteria 99,9% efficiency against mold and fungi
STERILIZER	CrossField Technology (Patent Pending)
UVC GERMICIDAL WAVELENGTH	254 nm
OZONE PRODUCTION	Zero
MONITORING	PM (1, 2.5 & 10), temperature and relative humidity. CO_2, CO, tVOC, Formaldehyde, O_3, NO_2, SO_2 (on demand for B2B models)
WIFI ENABLED	2,4/5 GHz
APP ENABLED	iOS and Android
SMARTPHONE CONTROL	Mode settings Fan speed control Air Quality detection Alert for ESP cleaning
SUSTAINABILITY	Zero waste solution No filter disposal Covers 100% made from recycled plastic
MAINTENANCE INTERVAL	UVC lamp life cycle: 5 years Filter replacement: filter-free technology
INSTALLATION	Wall mount
ACCESSORIES	Interchangeable external covers
WARRANTY	2 years

CLAIMS

1. A process for the purification of environmental air, comprising the following steps:

a) preparing a confined treatment zone (11) with at least one inlet (18) and at least one outlet (19) for a flow of moving air;

b) generating an electrostatic field in a first stage (30) of the treatment zone (11);

c) generating an electrostatic field in a second stage (40) of the treatment zone (11);

d) generating a flow of air between the inlet (18) and the outlet (19) of the treatment zone;

e) guiding the flow of air through the electrostatic and electromagnetic fields in the first stage (30) and in the second stage (40) of the treatment zone (11);

f) guiding the flow of air leaving the treatment zone (11).

2. Process according to claim 1, wherein it is envisaged to guide the flow of air through the electrostatic field in the first stage (30) and subsequently through the electromagnetic field in the second stage (40) of the treatment zone (11).

3. Process according to claim 1 or 2, wherein the electrostatic field is generated by a device comprising discharge electrodes (32) and capture electrodes (33)

arranged in the first stage (30) of the treatment zone (11).

4. Process according to any of the previous claims, wherein the electromagnetic field in the second stage (40) is obtained with ultraviolet radiation with a wavelength of between 250 nm and 280 nm.

5. Process according to any of the previous claims, wherein the treatment zone (11) comprises a channel that extends substantially linearly between the inlet and the outlet.

6. Process according to any of the previous claims, wherein the first stage (30) and the second stage (40) are positioned consecutive to one another, in other words the flow of air leaving one stage enters directly into the other.

7. Apparatus (1) for the purification of environmental air, comprising:

- a body (10) defining an internal compartment (11) in which there is a treatment zone, said body (10) having at least one inlet opening (18) and one outlet opening (19) which place the treatment zone (11) in communication with the outside environment;
- a first stage (30), in the treatment zone (11), equipped with a device (32, 33) for generating an electrostatic field;

- a second stage (40), in the treatment zone (11), equipped with a device (41) for generating an electromagnetic field;
- a ventilation device (20), configured to generate a flow of air between the inlet (18) and the outlet (19) of the treatment zone (11);
- a control unit connected to the devices (32, 33, 41) for generating the electrostatic and electromagnetic fields and to the ventilation device (20).

8. Apparatus (1) according to claim 7, wherein the treatment zone (11) has the shape of a substantially straight conduit or channel delimited at the ends by the inlet (18) and the outlet (19) respectively.

9. Apparatus (1) according to claim 8, wherein the treatment zone (11) has a flat, thin conformation where the ratio between the dimensions of the width between the inlet and outlet, or of the height, perpendicular to the width in a plane, and the dimension of the thickness is between 2 and 12.

10. Apparatus (1) according to any of the previous claims, wherein the device for generating the electromagnetic field comprises one or more sources of ultraviolet radiation, with a wavelength of between 250 nm and 280 nm.

11. Apparatus (1) according to any of the previous

claims, wherein the device for generating the electrostatic field comprises a pair of metallic plates (33), which act as capture electrodes, between which are arranged a plurality of filiform electrodes (32) which act as discharge electrodes and wherein the discharge electrodes are connected to a high-voltage power supply (35) and the metallic plates are electrically earthed.

12. Apparatus (1) according to claim 11, wherein the power voltage of the capture electrodes (32) is regulated so as to trigger the corona effect without producing electrical discharges.

13. Apparatus (1) according to any of the previous claims, comprising at least one sensor (60) indicating the quality of the incoming air, the control unit being connected to said sensor and being configured to command the devices for generating the electrostatic and/or electromagnetic fields, as a function of the values measured by said at least one sensor.

LABORATORIO ANALISI TECNAL

Overview of the study:

EVALUATION OF THE INACTIVATION OF AIRBORNE MICROORGANISMS THROUGH AIR SANITIZER OVER

(Prototype with electrostatic precipitator and UV-C led lamps combined system)

Issued on: 21/07/2021

Client: **Over S.p.A.**
Via Sante Bargellini, 62 Roma

Purpose of the study:

Evaluation of the inactivation % of in-duct airborne microorganisms with Over air sanitizer prototype.
The protocol used to conduct the test is adapted to the technical reference standard ISO15714:2019 *'Method of evaluating the UV dose to airborne microorganisms transiting in-duct ultraviolet germicidal irradiation devices'*.

The prototype instrument tested, is equipped with both systems: electrostatic precipitator and UV-C leds; this constructional feature, allows the technical protocol of ISO 15714 to be used only as a guideline limited to the evaluation of the percentage of microbial reduction.

Procedure:

Procedures described below are performed with each of the following microorganisms: *Serratia marcescens* ATCC13880*, Bacillus subtilis* ATCC6633 and *Cladosporium sphaerospermum* ATCC11289. *S. marcescens* is a gram-negative bacterium member of the Enterobacteriaceae family that representing the microorganism with high susceptibility to UV radiation. *B. Subtilis*, a Gram-positive bacterium from the Bacillaceae family, representing the microorganism with low susceptibility. Finally, *C. sphaerospermum* is spore-forming fungus representing the fungus with high resistance to UV radiation.
Test microorganism is initially grown on solid culture medium plates. From the colonies obtained on the plate, after appropriate dilutions, microbial solution is obtained at the desired cfu/mL concentration for inoculation. The microbial suspension is then introduced into the airstream via an aerosol generator connected in the inlet area. The sampling of the microorganism is achieved by an air sampler (SAS) in the outlet area of the device; in this system, air is aspirated at a fixed speed for variable times through a head with a series of small holes. The resulting laminar air flow is directed on the surface of an agar plate containing microbial growth medium. The culture medium plates are then incubated. The test is performed in triplicate with both operating conditions: electrostatic precipitator and UV-C LED lamps combined system off and on. Each result obtained is verified to have a relative difference of less than 50% otherwise the outlier result is discarded.

This study, carried out under the operating conditions described above and taking into account the technical details provided by the client, made it possible to obtain data useful for calculating the percentage of inactivation of airborne microorganisms. Specifically, the bacterial inactivation values derived from calculations using the cfu/m^3 values are shown in the following tables:

Table 1 – Bacterial inactivation values

Microorganism	***cfu/m^3 average value UV-C lamp off (N_0)***	***cfu/m^3 average value UV-C lamp on (N)***	**INACTIVATION RATE**	
			N_0/N % = (N_0-N)/N_0 x100	**Log(N_0/N)**
Serratia marcescens	1.100	0	100 %	3,56
Bacillus subtilis	213	0	100 %	2,85
Cladosporium sphaerospermum	1.733	10	99,42 %	2,24

The results obtained refer only to the prototype instrument tested under the conditions set up and described in the study.

Tecnal srl