InVid Tech
Innovative Video Technology

AURA AIR

Aura

AURA AIR

Certifications

Carbon Filter

Carbon filtering is a method that uses a bed of activated carbon to remove contaminants using a process called adsorption [24]. In this process, the molecules of the pollutant are trapped inside the porous structure of the carbon. This is a very effective method in the treatment of water and air, and it effectively removes volatile organic compounds (VOC's) and bad odors from air and water [24]. The efficiency of the carbon filter is determined by the amount of carbon inside the filter and the flow rate- the slower the rate of the air through the filter, the higher the exposure time of pollutants, the higher the efficiency of removal is as well [25].

Smart Fabric

Our smart fabric is made from cotton impregnated with copper oxide. Copper is a powerful anti-bacterial agent that also has the ability to neutralize viruses, fungus, and mold [26]. This is a patented and EPA-approved technology. The smart fabric is integrated into our Ray filter™ to enhance the ability of the filter to successfully deal with these pollutants. Fig. 1 shows a microscopic image of our smart fabric [27].

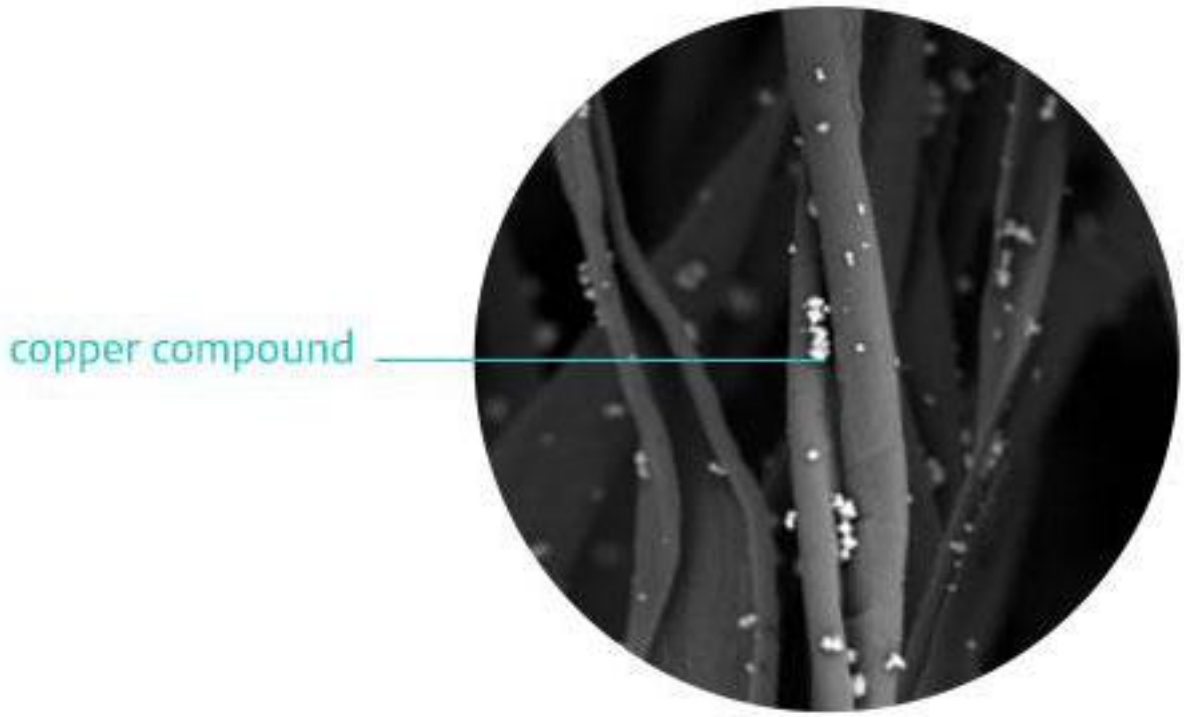

Figure 1: A microscopic image of the copper saturated fabric

Sterionizer

The Sterionizer is a device based on the technology of bipolar ionization. The process of ionization uses UV light and electric currents to transform molecules of oxygen (O_2) into two atoms (O) [28]. In this process, one of the atoms has an electron attached to it and as a result, it has a negative charge (O-) because electrons are negatively charged, and the other atom lacks an electron and is positively charged (O+) [28]. These atoms are very chemically active and when they attack molecules of water that are present in the air- there are two types of molecules formed: OH- and H_2O_2. These molecules attack and neutralize different pollutants- bacteria, fungus, mold, and viruses [29]. This technology has another advantage- unlike unipolar ionization that produces high amounts of ozone (O3)- which is a dangerous substance, the Sterionizer emits very low concentrations of ozone that cause no health damage.

Pre-filter

The pre-filter is a filter that removes large unwanted contaminants from air and water. In HVAC systems and air purifiers, it is usually a washable mesh made from polymers like polypropylene [30]. The pre-filter catches large particles of dust, pollen, insects, animal hair and other large particles [30]. The pre-filter has also a role in the extension of the life of the more sensitive filters that come after the pre-filter such as the HEPA filter.

UVc LEDs

Ultraviolet pressure lamps have been used for decades for the disinfection of air in hoods and clean rooms and for water disinfection. They are effective in neutralizing bacteria, viruses, and parasites by hurting the proteins on the cell membrane [31]. In the past several years UVc-LEDs showed the potential to replace those traditional lamps. These UVc-LEDs that work in the range of 267-310 nm were tested for water disinfection and the wavelength of 275 nm was found to be the most efficient and suitable replacement for the traditional lamps [32]. Although there isn't enough research done on these lamps in air, they have a promising potential to have a meaningful effect in air as well and for this reason they will be tested for Aura's device.

Smart Fabric Results

The efficacy of our smart fabric to decrease bacteria, viruses and mold is presented in Fig 9.

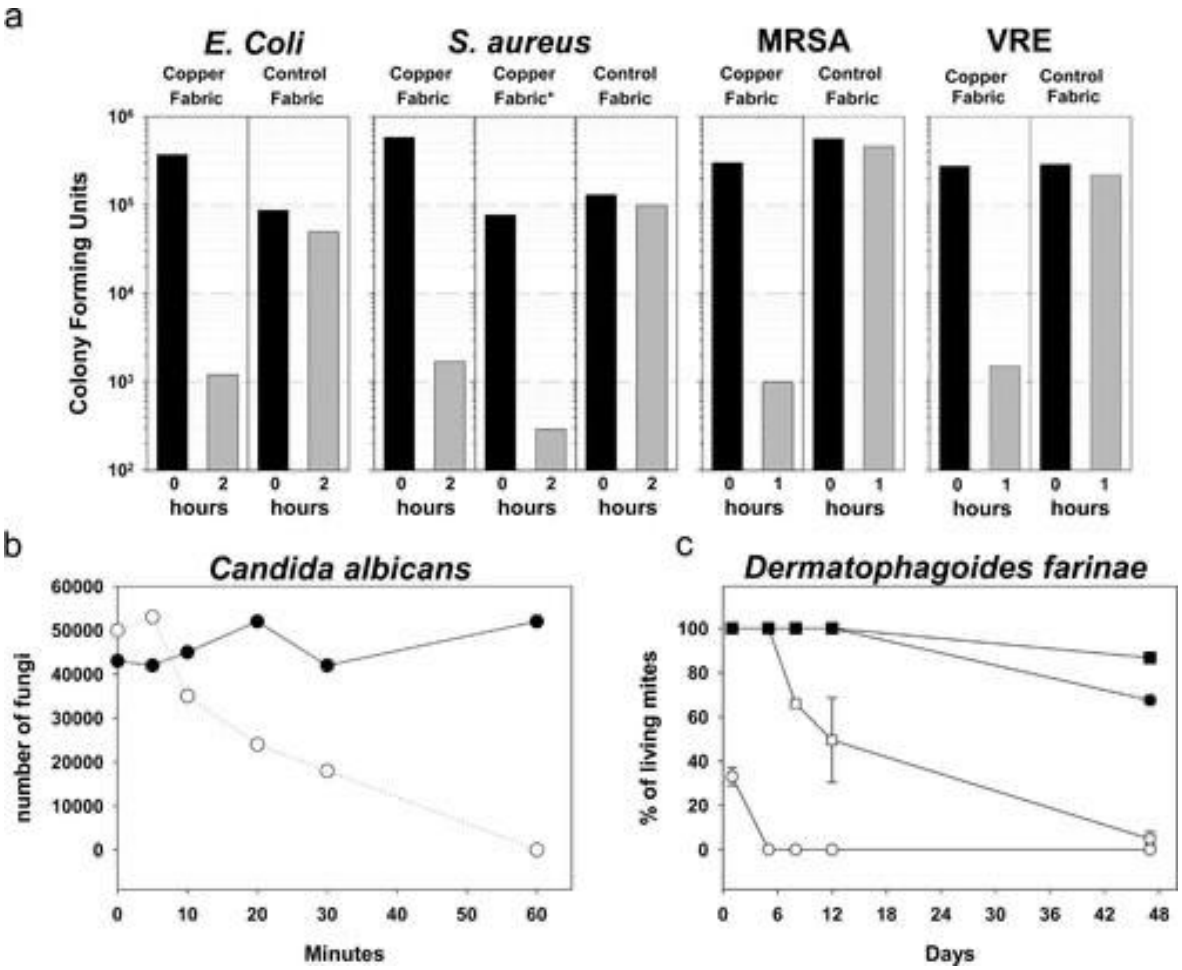

Figure 9. Anti-bacterial, anti-fungal, and acaricidal activity of copper fabrics. a) 1 ± 0.1 mL of a 24 h broth/bacteria culture were exposed to swatches of 20% copper fabrics or control fabrics for ~1 min (0 h) and 2 h (E. coli and S. aureus). Methicillin-resistant stapyhloccus aureaus (MRSA) and vancomycin-resistant enterococci (VRE) were exposed for ~1 min and 1 h. b) 1 ± 0.1 mL of a 24 h broth containing C. albicans were exposed between 0 to 60 min to swatches of control fabric (•) or 20% copper fabric (○). c) Approximately 200 dust mites (D. farinae) were cultured for 48 days in the presence of swatches of control fabric (•), 20% copper fabric (□), 100% copper fibers (○) or in the absence of any swatches ( ). [40]

Figure 9-(a) shows that the copper fabric decreased the amount of all kinds of bacteria for more than two logs of reduction (>2)- which means a reduction of more than 99% of bacteria after 2 hr of contact between the fabric and the bacteria titter. Figure 9-(b) shows that after 1 hr of contact with the fabric, 100% of the fungus were neutralized. Figure 9-(c) showed a reduction of 100% of the mites after 48 days of culturing with the fabric.

Examples of the plates after incubation are presented in Figures 12-13:

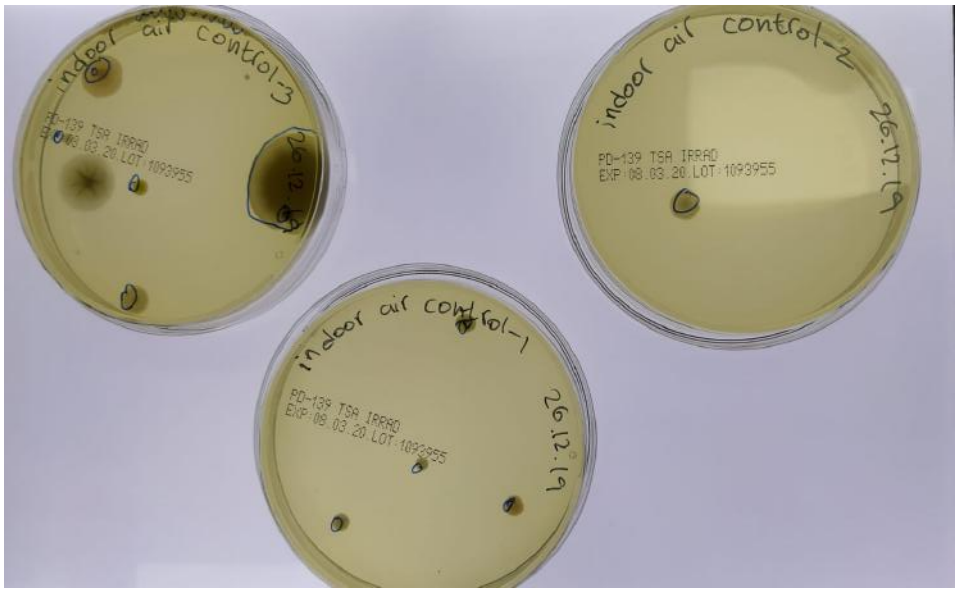

Figure 12: incubation results of the control plates on December 31st,2019

Figure 13: incubation results of the Ray filter+ Sterionizer+ UVc LEDs plates on December 31st,2019

Sheba Medical Hospital Clinical Trial

Testing Results

Results processing: The data measured by the RT-PCR system at # 32 was used to evaluate the results of the experiment. This have been defined as the last point in which measurements of control samples do not show saturation of detector and prevent misunderstanding of the results.

Results:

Sample	Coronvirus Reduction Ratio [%]
Ref.1	
HEPA rep1	**99.7243**
SCF rep.1	**99.9744**
Sterionizer ™ LP rep.1	**99.9651**
Sterionizer ™ HP rep.1	**99.9429**
UVC LED rep.1	**99.9631**

Certificate of Analysis

EMSL Analytical, Ltd.

Bipolar Ionization System STERIONIZER™ from Filt-Air Ltd.

Analytical Testing Results for STERIONIZER™

Microbial efficacy testing was conducted on STERIONIZER™ to assess its abilities to disinfect (kill) bacteria, fungi and yeast in the air.

Testing consisted of aerosolizing the selected microorganisms in a test chamber, followed by exposure to the STERIONIZER™ at different time intervals.

Test Results

After 120 minutes exposure	Reduction in %
E. coli	99.43%
C. cladosporioides	97.69%
A. niger	97.14%
S. aureus	81.67%
C. albicans	36.27%

Conclusion

The STERIONIZER™ demonstrated both efficacy and ability to reduce bacteria and fungi in the air.

Jason Dobranic, Ph.D.
National Director of Microbiology

Certificate of Analysis

財団法人
北里環境科学センター

Kitasato Research Center for Environmental Science

Bipolar Ionization System STERIONIZER™ from Filt-Air Ltd.

Analytical Testing Results for **STERIONIZER™**

Viral efficacy testing was conducted on STERIONIZER™ to assess its abilities to remove influenza virus H1N1 in the air.

Testing consisted of aerosolizing the influenza virus in a test chamber, followed by exposure to the STERIONIZER™ at different time intervals.

Test Results

Operating time	Reduction in %
After 30 minutes exposure	92
After 60 minutes exposure	> 98.92

Conclusion

The STERIONIZER™ demonstrated efficacy to reduce virus in the air.

Toshihiro ITOH Ph. D.
president

Certificate of Analysis

EMSL Analytical, Ltd.

Bipolar Ionization System STERIONIZER™ from Filt-Air Ltd.

Analytical Testing Results for STERIONIZER™

Microbial efficacy testing was conducted on STERIONIZER™ to assess its abilities to disinfect (kill) Staphylococcus aureus MRSA, in the air.

Testing consisted of aerosolizing the selected microorganisms in a test chamber, followed by exposure to the STERIONIZER™ at different time intervals.

Test Results

Exposure in time	Reduction in %
1 min.	*76.30%*
5 min.	*74.22%*
15 min.	*48.63%*
30 min.	*99.75%*
60 min.	*99.47%*

Conclusion

The STERIONIZER™ demonstrated both efficacy and ability to reduce bacteria Staphylococcus aureus MRSA in the air.

Farbod Nekouei, M.S., Laboratory Manager
or Other Approved Signatory

CERTIFICATE OF COMPLIANCE

Certificate Number	20130521-E336892
Report Reference	E336892-20100425
Issue Date	2013-MAY-21
Issued to:	FILT AIR LTD DEREKH HAYEQEV, PO BOX 166 30951 ZIKHRON-YAAQOV ISRAEL
This is to certify that representative samples of	COMPONENT - POWER SUPPLIES, ELECTROSTATIC AIR-CLEANING EQUIPMENT USR, CNR - Component - Power Supply, Electrostatic Air Cleaner, Ion Generator, Models IS1-12DX, IS1-12D3, and IS1-12D5, IS1-12DX-S1, IS1-12D3-S1, IS1-12D5-S1, IS1-12D5-S2 and IS1-12D5-S5. Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL 867 and C22.2 No. 187-09 - Electrostatic Air Cleaners
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Recognized Component Marks for the U.S. and Canada should be considered as being covered by UL's Recognition and Follow-Up Service and meeting the appropriate U.S. and Canadian requirements.

The UL Recognized Component Mark for the U.S. generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark: , may be used in conjunction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceding the recognitions or under "Markings" for the individual recognitions. The UL Recognized Component Mark for Canada consists of the UL Recognized Mark for Canada: and the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

Look for the UL Recognized Component Mark on the product.

William R. Carney

William R. Carney, Director, North American Certification Programs

UL LLC

TURKISH REPUBLIC
ISTANBUL UNIVERSITY
ISTANBUL FACULTY OF MEDICINE
Department of Microbiology and Clinical Microbiology

TO WHOM IT MAY CONCERN

"VIRUSSAFE MEDICAL AIR PURIFIER" branded Filterless Plasma Ion Generator- Air Sterilization Equipment's affectiveness is tested by our Head Microbiological Department Laboratories by request of Equipment manufacturer Nero Industries LTD.

Test Startup Date: 22.11.2010

Test Termination Date: 20.01.2011

Test Location: Istanbul Faculty of Medicine, Department of Microbiology and Clinical Microbiology

Test Material : VIRUSSAFE MEDICAL brand, Filterless Plasma Ion Generator, Model- Air Sterilization Equipment

Test Equipments : 1 m^3 Volume Isolated Test Chamber with Solution Diffuser and Safe Reach Accessories.

Test Procedure : The test based on sterilization of the air contaminated with different bacterial strains. For this purpose, 1 m^3 volumetric isolated test chamber was performed. One Virussafe Medical Air Purifier Unit was placed on the floor of the chamber. Bioburden of environmental air with bacteria was mesured before getting in action with VIRUSSAFE MEDICAL Equipment. The Petri dishes were opened and collected by the using sterile hand gloves. The test was conducted by opening Petri dishes containing bacterial media previously prepared on the floor of the chamber followed by pulverization of 100 ml of bacterial suspension containing 10^5 CFU bacteria/ml density for 5 minutes to chamber air. The following bacteria were used; *Staphylococcus aureus ATCC 6538, Pseudomonas aeruginosa NCTC 6749, Escherichia coli ATCC 11229, Bacillus subtilis var.niger ATCC 9372* . The equipment was started up and at the end of the tested times; 5 , 15, 30 ,and 60 minutes, all Petri dishes were collected and incubated at 35 °C for 48 hours. The ratio of change in bacetial colony number (amount) CFU was recorded and calculated accordingly. The experiments were repeated 3 times and the mean number was shown in the table below.

Table 1: Bacteria Colony Count and Reduction Data

Bacterial culture in Petri dish	**S.aureus ATCC 6538 Activation time (minutes)**			**P.aeruginosa NCTC 6749 Activation time (minutes)**			**E.coli ATCC 11229 Activation time (minutes)**			**B. subtilis var niger ATCC 9372 Activation time (minutes)**		
	0	**5**	**60**	**0**	**5**	**60**	**0**	**5**	**60**	**0**	**5**	**60**
Colony Forming Unit (cfu) Quantity	1333	230	113	163	6	-	51	44	2	186	36	20
% Reduction	0	82.70	91.50	0	96.30	99.99	0	86.53	91.15	0	80.70	89.30

(-): No growth

As seen on the table, the equipment performed sterilization on the tested bacteria as %82,7 to %96,3 in five (5) minutes and % 91.5-% 99.99 sterilization in 60 minutes.

"VIRUSSAFE MEDICAL AIR PURIFIER" brand , Filterless Plasma Ion Generator- Air Sterilization Equipment 's performance is recorded and approved on the air contaminated with pathogenic microorganisms, thus, playing an important role in reduction of epidemic infection risk and have preventation usage.

Head of Department

Prof. Dr. Bülent GÜRLER

NOTE:These results are valid only for experimented sample and not to be used for advertising purposes.

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Nakhonpathom, 73140, THAILAND

January 23th, 2012

Dear Sir/Madam

We are pleased to inform to you that we study the efficacy of "Samurai Ionizer" (IWS1 and ISI-12D3) to inactivate highly pathogenic avian influenza H5N1. The residue of the virus (after directly applied "Samurai Ionizer" onto the virus containing allantoic fluid) is checked by virus isolation based on method of Office International des Eqizootics (OIE), inoculation into allantoic sac of chicken embryonic eggs, hemagglutination test, and hemagglutination-inhibition test. It is found that "Samurai Ionizer" (IWS1 and ISI-12D3) can inactivate the virus, $10^{5.8}$ EID_{50} in 1.0 ml of allantoic fluid completely within 10 minutes.

Regards,

(Assoc. Prof. Dr.Thaweesak Songserm) D.V.M., Ph.D.
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Faculty of Veterinary Medicine
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Nakornpathom 73140, Thailand
Tel: 66-34-351-901
Fax: 66-34-351-405
E-mail: fvettss@ku.ac.th

Details of the test

"Samurai Ionizer" (IWS1 and ISI-12D3) were tested for their inactivation efficacy of highly pathogenic avian influenza (HPAI) H5N1. The test was performed by direct releasing the ion from "Samurai Ionizer"onto $10^{5.8}$ EID_{50} in 1.0 ml of virus containing allantoic fluid. The ion was directly released 10^{9} ion/second on the virus at 1 inch in depth. The virus in allantoic fluid was collected by swabbing and then re-isolated in chicken embryonic eggs at 0, 5, 10, 15, 20, 25, 30 minutes after application of "Samurai Ionizer". The virus was tested by hemagglutination test and hemagglutination- inhibition test.

Result

Samurai Ionizer	The most minimal minute that the equipment could completely inactivated the HPAI H5N1 virus, $10^{5.8}$ EID_{50} in 1 ml allantoic fluid, when applied the equipment 1 inch above the fluid.
IWS1	10 minutes
ISI-12D3	10 minutes

.....

The Standards Institution of Israel

This is to certify that:

Bipolar Ionizer

Trademark: STERIONIZER™

Models: IS1-12DX, IS1-12D3, IS1-12D5

Manufactured by: Filt-Air Ltd.

Address: 1 Avshalom Road, P.O.B. 166,
Zikhron Yaaqov 30951, Israel

CERTIFICATE OF CONFORMITY

has been tested by SII and found to comply with the standard requirements of:

EN 60335-2-65 "Household and similar electrical appliances – Safety – Part 2-65: Particular requirements for air-cleaning appliances", 2003

used in conjunction with

EN 60335-1 "Household and similar electrical appliances – Safety – Part 1: General Requirements", 2002, including Amendments A11: 2004, A1: 2004, A12: 2006, and A2: 2006

Test results are detailed in SII Test Report No.: 9012311173.

Certificate No.: 9012311173

Eng. Michael Terman
Acting Head of Electrical Safety Branch
Electronics and Telematics Laboratory

Date of issue: 10/03/2010

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