



EUGENIDIO CLINIC UNIVERSITY OF ATHENS

Laboratory of Medical Biopathology and Molecular
Medicine



Test investigation under real conditions on the effectiveness of a photocatalytic paint system in reducing the bacterial load in certain environments - the interior walls and the indoor room air

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The building



For the conduction of the specific research one room in the first floor of the clinic was used: room number 111. The basic reason was to limit the influence of possible different test conditions affected by factors, such as indoor air quality and ventilation conditions, temperature, humidity, medical treatments and cleaning methods. An important objective was to investigate the effectiveness of the photocatalytic paint system in real time conditions such as daily and uncertain urgent conditions. For this reason, during the experiment the test the room was, most of the time, occupied by patients and in general, it was under full medical service function. No cleaning methods concerning wall treatment took place during the test measurements.

The building

For the conduction of the bacterial load test, Air Ideal 3P instrument by Biomerieux was used. The portable meter of VOC ppb RAE Plus (RAE systems) was used for the measurements of volatile organic compounds. The measurements for the PM pollution were realised by the recorder of mass of floating particles (Model 8520 DUSTTRAK™ Aerosol Monitor)

For the treatment of the Room, ABOLIN's Photocatalytic paint ACTIVE COOL was applied.



The absolute offered technology used by the *Active Cool* paint demonstrates a dual continuous action: When regularly applied on exterior walls, it transforms air pollution into harmless residues and, at the same time, performs a reflective barrier, which allows the limitation of energy use for cooling. As an interior wall coating, it prevents the formation of bacteria colonies onto walls and at the same time acts as an air cleaner. The Active Cool is a unique and a simple solution where the need for improved air quality and thermal comfort conditions is of high importance. It is suitable for any kind of mineral surface. Limited Voc's content, no preservatives or heavy metals.

Test Examination for the bacterial load Before the treatment with Photocatalytic Coating on 5th of May

Scientific Director: Professor N.I Legakis. Microbiologist
 Head of laboratory: Dr. M.Tsakiri. Biopathologist
 Scientific expert: Mrs. E.Karahaliou. Lab Technician

Blood Agar Test: Walls	5 Colonies/m²
Blood Agar Test: Indoor Air	600 Colonies/m³
Mackonkey Agar Test: Walls	Barren
Mackonkey Agar Test: Indoor Air	3 Colonies/m³ Gram (-) Bacteria
Sabouraud Agar Test: Walls	Barren
Sabouraud Agar Test: Indoor Air	5 Colonies/m³ Penicillium

Indoor air quality Test Before the treatment with Photocatalytic Coating on 5th of May

Scientific Supervisor: Prof. Mat Santamouris
 Research Associates: Dr. Afroditi Synnefa

Investigation Area: Indoor Air	On Average	Not acceptable for EU above
VOC Concentration (µg/m ³)	491 µg/m ³	200 µg/m ³
PM1 Concentration (µg/m ³)	7.4 µg/m ³	Unacceptable limits
PM2,5 Concentration (µg/m ³)	14 µg/m ³	40µg/m ³
PM10 Concentration (µg/m ³)	21 µg/m ³	50µg/m ³

Test for the bacterial load After the treatment with Photocatalytic Coating on 19th of May

Blood Agar Test: Walls	Barren
Blood Agar Test: Indoor Air	345 Colonies/m³
Mackonkey Agar Test: Walls	Barren
Mackonkey Agar Test: Indoor Air	Colonies/m³ Gram (-) Bacteria
Sabouraud Agar Test: Walls	Barren
Sabouraud Agar Test: Indoor Air	6 Colonies/m³ Penicillium

The condition of surfaces such as walls, as well as indoor air quality in critical spaces such as hospitals, are very important factors concerning healthcare services. Additionally, factors that can contribute in a positive way in reducing healthcare risks, such as hospital infections, are very important. Test results under real conditions have demonstrated that the application of a photocatalytic coating on the walls of hospital room can contribute significantly in reducing colonies of Mackonkey Agar and Blood Agar on the walls and the indoor air. The coincidental increase in the measurement of Penicillium colonies/ m³ during the test and after the application of the photocatalytic coating can not be attributed to the photocatalytic process, but in other non permanent sources/ factors.

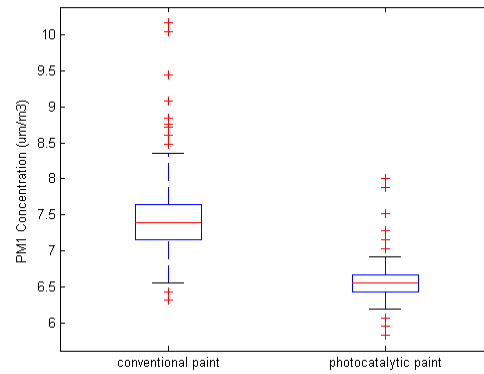
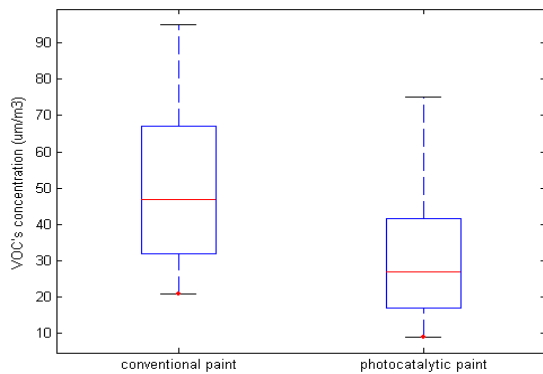
Test After treatment with Photocatalytic Coating on 19th of May

Investigation Area	Mackonkey Agar Test	Blood Agar Test
Walls		100% Reduction
Indoor Air	33% Reduction	42% Reduction

Test for the Indoor air quality After treatment with Photocatalytic Coating on 19th of May

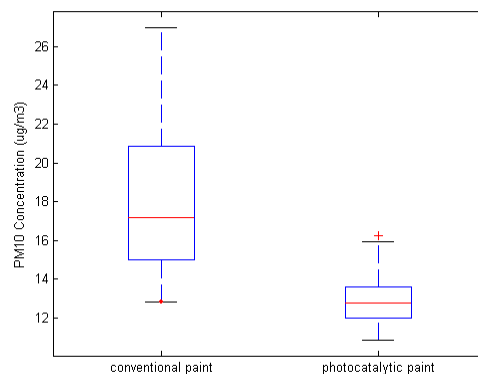
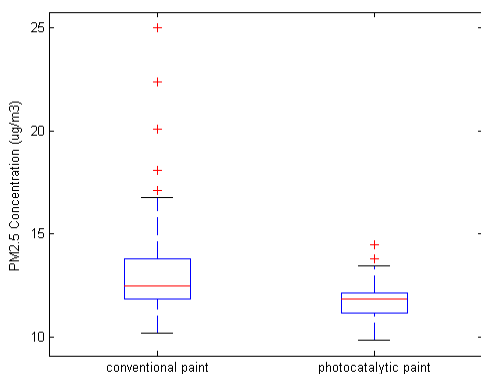
Investigation Area: Indoor Air	On Average	Not acceptable for EU above
VOC Concentration ($\mu\text{g}/\text{m}^3$)	29 $\mu\text{g}/\text{m}^3$	200 $\mu\text{g}/\text{m}^3$
PM1 Concentration ($\mu\text{g}/\text{m}^3$)	6.2 $\mu\text{g}/\text{m}^3$	Not acceptable at all
PM2,5 Concentration ($\mu\text{g}/\text{m}^3$)	11,5 $\mu\text{g}/\text{m}^3$	40 $\mu\text{g}/\text{m}^3$
PM10 Concentration ($\mu\text{g}/\text{m}^3$)	12,5 $\mu\text{g}/\text{m}^3$,	50 $\mu\text{g}/\text{m}^3$

Test After the treatment with Photocatalytic Coating on 19th of May



The reduction of Volatile Organic Compounds was 40%.

The reduction of particulate matters PM1 was 11%.



The reduction of particulate matters PM2.5 was 5%.

The reduction of particulate matters PM10 was 25%.

ACTIVE COOL

Photocatalytic Ecoactive system

Special Characteristics

- Reduces the temperature of building envelope
- Improves indoor thermal comfort conditions
- Saves energy from Cooling
- Contributes to air pollution reduction
- Contributes to the mitigation of Urban Heat Island phenomenon
- Improves indoor and outdoor air quality
- Helps keep the aesthetic option of the walls clean
- Deodorising activity
- Anti-microbial activity
- Anti-mould activity



The ACTIVE COOL fights harmful substances such as the Volatile Organic Compounds, Nitrogen Oxides, Benzene, Sulfur Dioxides, Bacteria, Particulate Matters, Mould.

In addition, in comparison to ordinary paints with the same colour, it performs a supreme high solar reflective matt surface which blocks the incoming sun rays, helping you keep your home cooler.