

Pablo

**Report Ref: 904 / 05**

**EFFICIENCY OF AIRFREE P AIR CLEANER ON THE REDUCTION OF  
AIRBORNE MICROORGANISMS IN CLOSED ENVIRONMENT.**

**AIM**

The main goal of this study was to verify an air cleaner (Airfree P) efficiency on the reduction of bacteria and fungi suspended in the air in closed environments. The study intended to analyze the airborne microbial charge in room 1070 of the Industrial Microbiology Laboratory of INETI, during the functioning period (36 days) of the referred device.

**METHODOLOGY**

**Protocol**

The device was installed in room 1070 of the Industrial Microbiology Laboratory (LMI) after 11 days of regular utilization without any kind of cleaning or disinfection. That room has an approximate area of 60 m<sup>2</sup> (645.8 sq ft) and is characterized as being a Molecular Biology laboratory. The average frequency to this room was 7 to 9 people per day.

The test had 54 days duration. The device was turned on November 4<sup>th</sup> 2005 and turned off December 9<sup>th</sup> 2005. The air sample collections were made all Monday and Friday.

One air sampler (Merck's MAS-100) was used for air sampling having samples been taken in 3 different points in the room. From each point, 100 liters of air were collected. The count of the microorganism in suspension in the air was done in 9 cm (3.5 ") diameter Petri dishes.

Ministério da Economia e Inovação  
**INSTITUTO NACIONAL DE ENGENHARIA, TECNOLOGIA E INOVAÇÃO LP.**  
*Laboratório de Microbiologia Industrial*

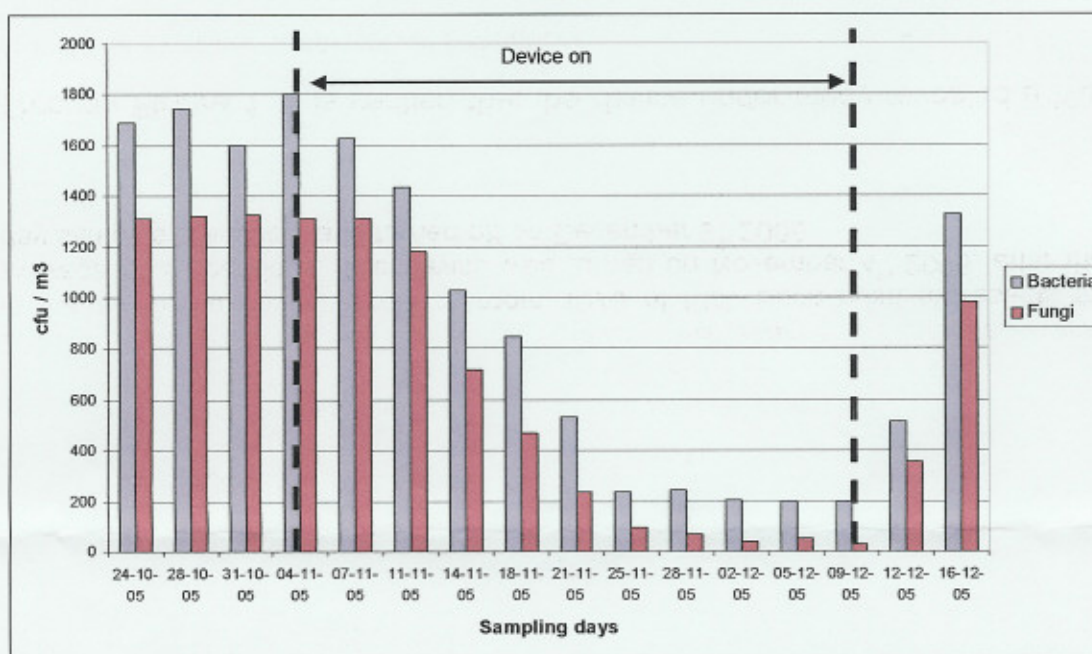
Azinhaga dos Lameiros à Estrada do Paço do Lumiar 1649-038 LISBOA Telef: 21 716 51 41 Fax: 21 716 69 66

For bacteria, Trypona Soya Agar (TSA) Oxoid culture medium in Petri dishes were used and Petri dishes were incubated at 30°C (86F) for 3 days. For fungi, Malt Extract Agar (MEA) Difco culture means in Petri dishes were used and Petri dishes were incubated at 25°C (77F) for 5 to 7 days.

The results were expressed in **colonies forming unity (c.f.u.) of existing microorganisms per m<sup>3</sup>** of air in the room. Each value represents the arithmetic average of three samples.

## RESULTS

The results are presented on the graphic of **figure 1**:



**Figure 1.-** Effect of Airfree P sterilizer , on the maintenance of the microbial level in the air in the environment of room 1070 of LMI. Each point represents the average of 3 countings. The device was turned on November 4<sup>th</sup> 2005, after that day samples collection, and turned off on December 9<sup>th</sup> 2005.

Through **Figure 1**, it is verified that the device under study revealed a high efficiency in airborne microbial reduction.

Ministério da Economia e Inovação  
**INSTITUTO NACIONAL DE ENGENHARIA, TECNOLOGIA E INOVAÇÃO I.P.**  
*Laboratório de Microbiologia Industrial*

Azinhaga dos Lameiros à Estrada do Paço do Lumiar 1649-038 LISBOA Telef: 21 716 51 41 Fax: 21 716 69 66

To better specify the study of the device efficiency, the percentage reduction values are stated in **Table 1 and 2**.

**Table 1.** The initial and final counts of airborne bacteria charges and its correspondent reduction percentage for the tested device.

<b>Initial Counting (cfu/m<sup>3</sup>) Average 2 readings</b>	<b>Final Counting (cfu/m<sup>3</sup>) Average 2 readings</b>	<b>Reduction (%)</b>
1700	200	88

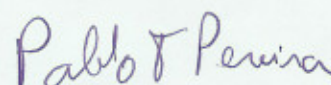
**Table 2.** The initial and final counts of airborne fungi charges and its correspondent reduction percentage for the tested device.

<b>Initial Counting (cfu/m<sup>3</sup>) Average 2 readings</b>	<b>Final Counting (cfu/m<sup>3</sup>) Average 2 readings</b>	<b>Reduction (%)</b>
1318	50	96

The results testify and confirm the high efficiency in the reduction of bacteria and fungi in the environment air under the studied conditions.

Lisbon, December 28<sup>nd</sup> 2005

Head of LMI



Pablo Tavares Pereira