

HISPACOLD

Executive report of the study of the efficiency of the elimination of volatile organic compounds, microorganisms in suspension and particles from the air purification equipment.

Hispacold e₃



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This executive report springs from HISPACOLD's interest in conducting a study of the efficiency of the aire eCo₃ air purification equipment with the aim of checking the degree of reduction in levels of bacteria, virus, unpleasant odours, allergens and moulds while still maintaining the natural proportion of oxygen inside the vehicles.

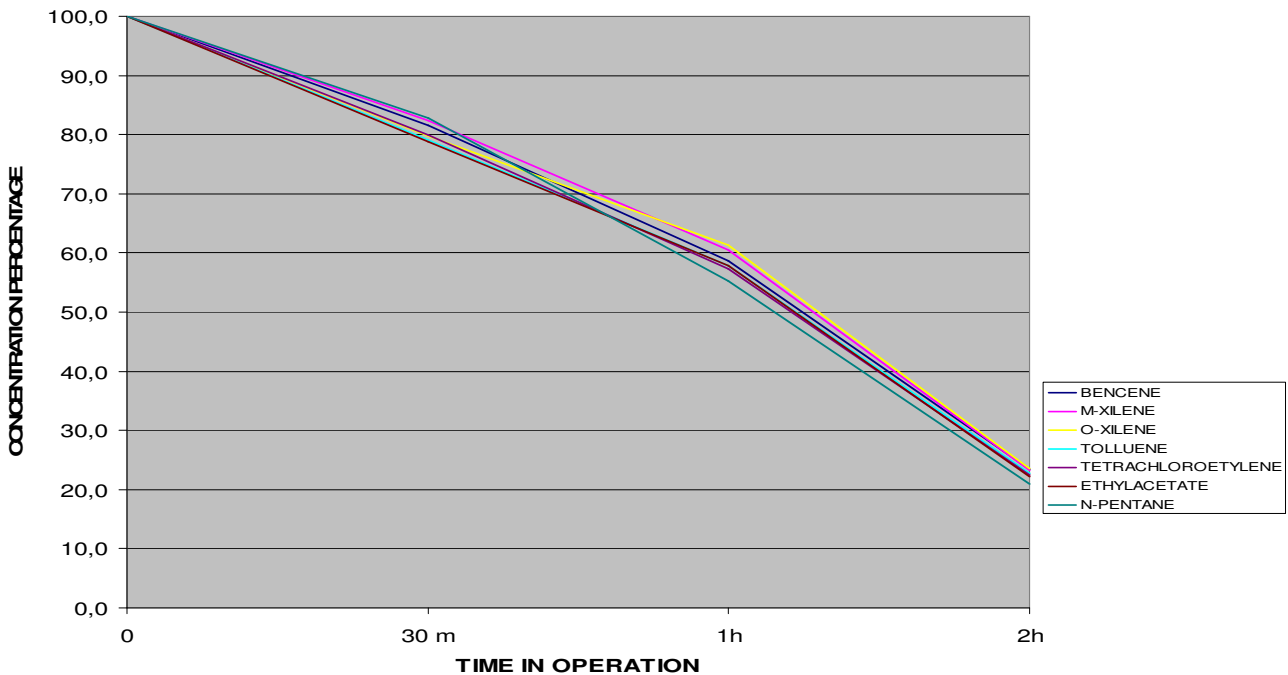


VOLATILE ORGANIC COMPOUNDS (VOCs)

The method of analysis is the one specified by UNE Standard 81586 for analysing and detecting volatile organic compounds.

After introducing known Volatile Organic Compound substances these were then analysed and the results shown in the following graph were obtained:

VOLATILE ORGANIC COMPOUNDS



It can be seen that after the eCo₃ equipment has been working for 2 hours the concentration of Volatile Organic Compounds analysed is reduced to an average of 22.3% compared to the initial maximum values. When the same measurement is taken without the air treatment equipment working, the average reduction values obtained with respect to the maximum value was 53.1%.

MICROORGANISMS IN THE ATMOSPHERE

The method of analysis applied was the SGS TECNOS internal procedure reference: "PE.T/943-LAB/CAIM05 Procedure for the identification and counting of microorganisms in suspension and on surfaces" accredited by ENAC according to UNE EN ISO/EC 17025 criteria.

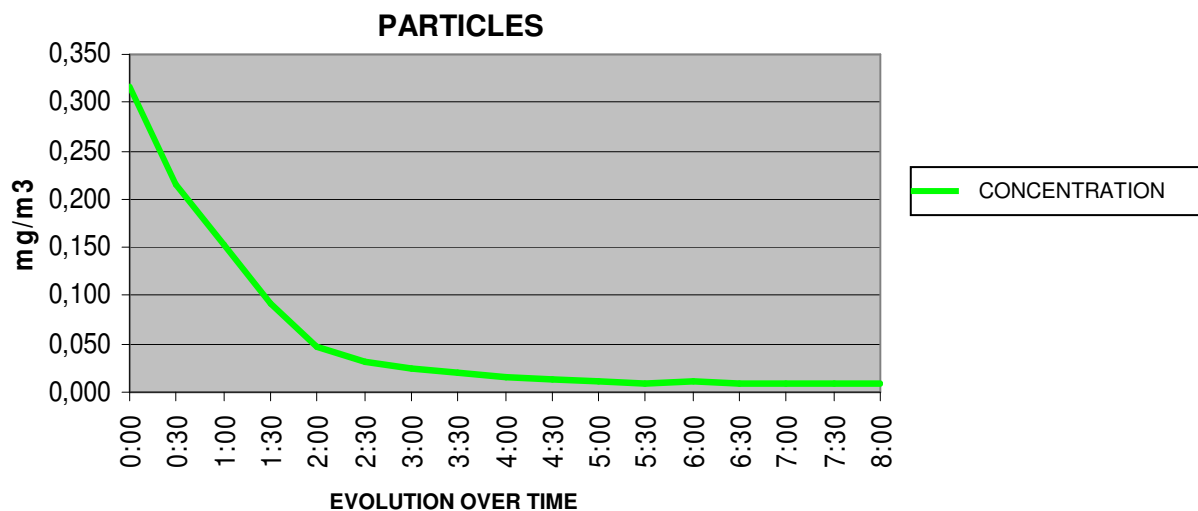
Once a comparative microbiological study had been conducted with the air treatment equipment both switched on and off, it was noted that the microbiological levels had undergone significant decreases when the eCo₃ equipment was working.

In some of the samples the reduction in these levels of bacteria for certain species, such as Micrococcus spp and Staphilococcus spp, achieved values of more than 50%.

DETERMINATION OF PARTICLES SUSPENDED IN THE AIR

The method of analysis applied was based on direct measurement via laser diffraction.

A graph is provided below showing the particle variation (those in suspension which show a respirable fraction (PM 10), composed of those whose diameter is less than 10 micra) with the eCo3 air treatment functioning.



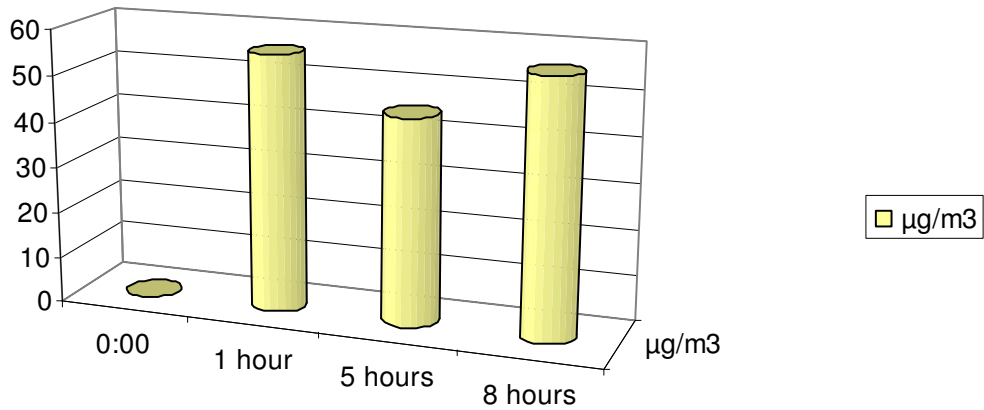
As can be seen in the graph, there was a reduction in the concentration of particles in the first two hours during which the equipment was functioning and thereafter the concentration readings remained very low.

OZONE

For the determination of the concentration of ozone in the air in suspect areas, a known volume of air was made to circulate through a previously weighed fibre glass filter impregnated with NaNO_2 . Method OSHA ID-214.

Measurements of ozone were taken for the purpose of verifying whether this compound was generated as a result of using the eCO_3 air purification equipment.

INCREASE OF OZONE CONCENTRATION WITH EQUIPMENT WORKING



As can be seen from the graph, the equipment generates a small ozone concentration (56 $\mu\text{g}/\text{m}^3$ as the maximum level) taking as a reference the 200 $\mu\text{g}/\text{m}^3$ that the INSHT (National Institute for Occupational Health and Safety) considers as the TLV (Threshold Limit Value).