Maria Soler

Asunto: RE: Newsletter Photocitytex 3

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Asunto: Newsletter Photocitytex 3

3rd Project Newsletter

PHOTOCITYTEX project began on 1st of July, 2014 to find demonstrate solutions and validate the use of textiles with photocatalytic activity in terms of decontamination of urban atmospheres. (LIFE13 ENV/ES/000603) The project is coordinated by CEAM - Centro de Estudios Ambientales del Mediterráneo (Spain) and the project partners are AITEX (Spain), Ayuntamiento de Quart de Poblet (Spain), Next Technology Tecnotessile (Italy) and Legambiente Emilia Romagna (Italy).

GOALS OF THE PHOTOCITYTEX PROJECT

Despite legislation and constant efforts and initiatives to improve air quality in city centres, we have not managed to reverse the negative impact that poor air quality has on health and the environment. Traffic pollution is increasing alarmingly and incidences of high concentrations of nitrogen oxide (NOx) are regular occurrences. High levels of nitrogen dioxide (NO_2) cause lung conditions, increased respiratory infections and a worsening of the symptoms associated with asthma and allergic reactions. Additional decontamination approaches are urgently needed if we are to achieve safer, cleaner air quality levels and in recent years, the use of photocatalytic materials treated with titanium dioxide (TiO_2) to scrub air has been researched.

This is the background behind the European project PHOTOCITYTEX, whose core goal is to evaluate the effectiveness of TiO_2-treated fabrics in the purification of contaminated air.

LARGE-SCALE DEMONSTRATION OF THE EFFECTIVENESS OF PHOTOCATALYTIC FABRICS

One of the principal activities being undertaken within the framework of PHOTOCITYTEX, is a large-scale demonstration of the use of photocatalytic fabrics in the decontamination of urban air, which includes the following actions:

- The development and characterisation of prototype photocatalytic awnings and wall coverings.

A range of prototypes were developed in the laboratory using different processes which were then characterised physically, chemically and functionally. Two of these were then selected for large-scale manufacture: one using an acrylic fabric treated with a coating of TiO2 which was used to create a photocatalytic covering, and a PVC fabric treated with a coating of TiO2 on both faces to create an awning.

- A demonstration of the photocatalytic performance of the functional prototypes in the EUPHORE simulation chamber.

The two prototypes were installed in the EUPHORE chamber (a Teflon dome with a volume of approximately 200 m3 which can simulate atmospheric conditions in a range of European cities under natural sunlight) to demonstrate their effectiveness. Summer and winter contamination levels in Paris, Bolonia and Quart de Poblet in Valencia were recreated, and contamination levels were recorded before and after installation, and compared to the results achieved using non-photocatalytic fabrics

Installing the prototype fabrics in the EUPHORE chamber.

- A demonstration of the photocatalytic performance of the textile prototypes in an urban environment - Quart de Poblet

In order to demonstrate the fabric's effectiveness at decontaminating urban air in a real environment, the prototypes were installed at different locations in Quart de Poblet: within the A3 tunnel in the entry to the town, and at a local school.

Photo A. Photocatalytic awning installed at the local school, with measuring and sampling systems

Photo B. Photocatalytic covering installed in the A3 tunnel with measuring and sampling systems

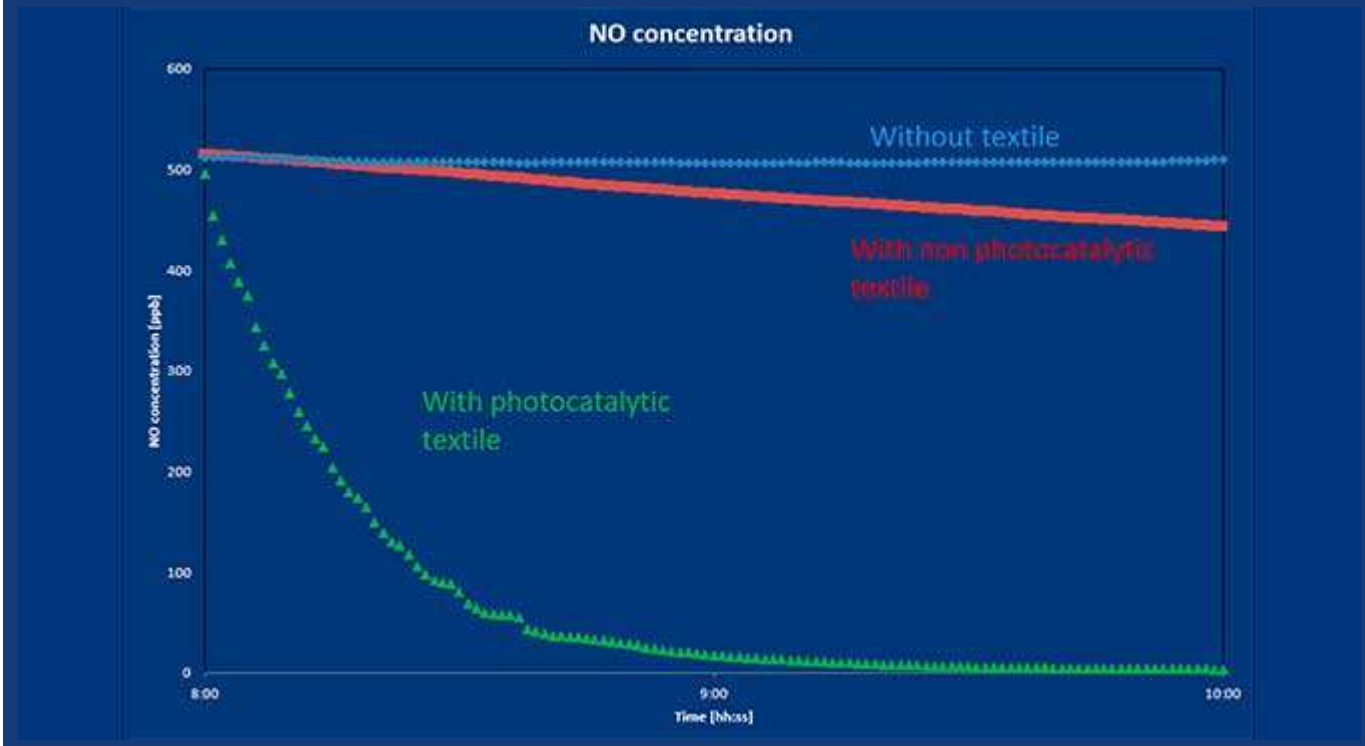
RESULTS OF THE INITIAL READINGS

Measurements are being taken regularly at the installations to determine levels of air contamination before and after installation, to evaluate the prototype's effectiveness.

The results obtained, both in the EUPHORE simulation chamber and in the real urban environments in the A3 tunnel and the school are certainly promising:

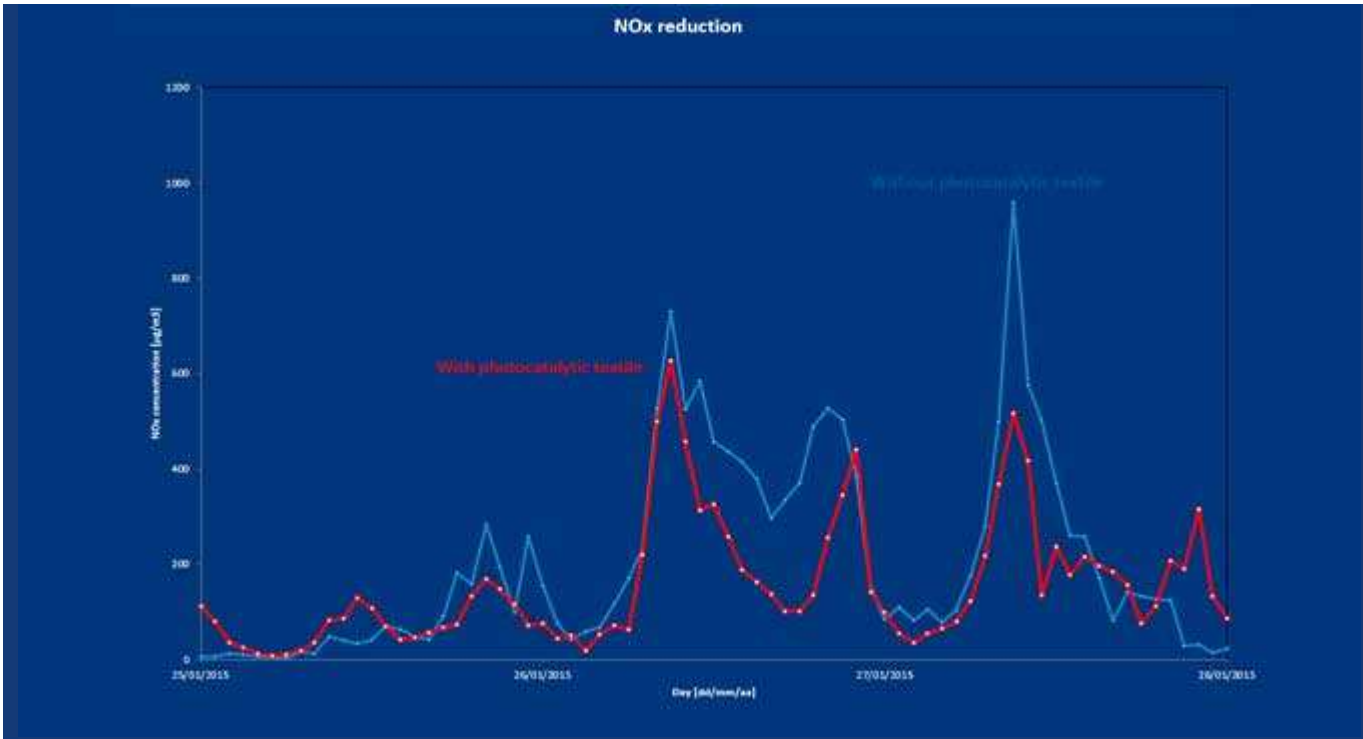
- 90% reduction in NOx in an hour, under controlled conditions in at EUPHORE:

35m2 of photocatalytic awning installed in a volume of 200m3 of air; significantly better than expected from initial previsions, which indicated a 30% reduction over 8 hours.



Nitrogen Oxide reduction with and without the photocatalytic textile: EUPHORE test

- 25% reduction in NO2 near the textile in a real environment:
Annual readings before and after installation returned reductions of NO2 of 25% near the installation, which is a real improvement over the calculated reduction of 20%.

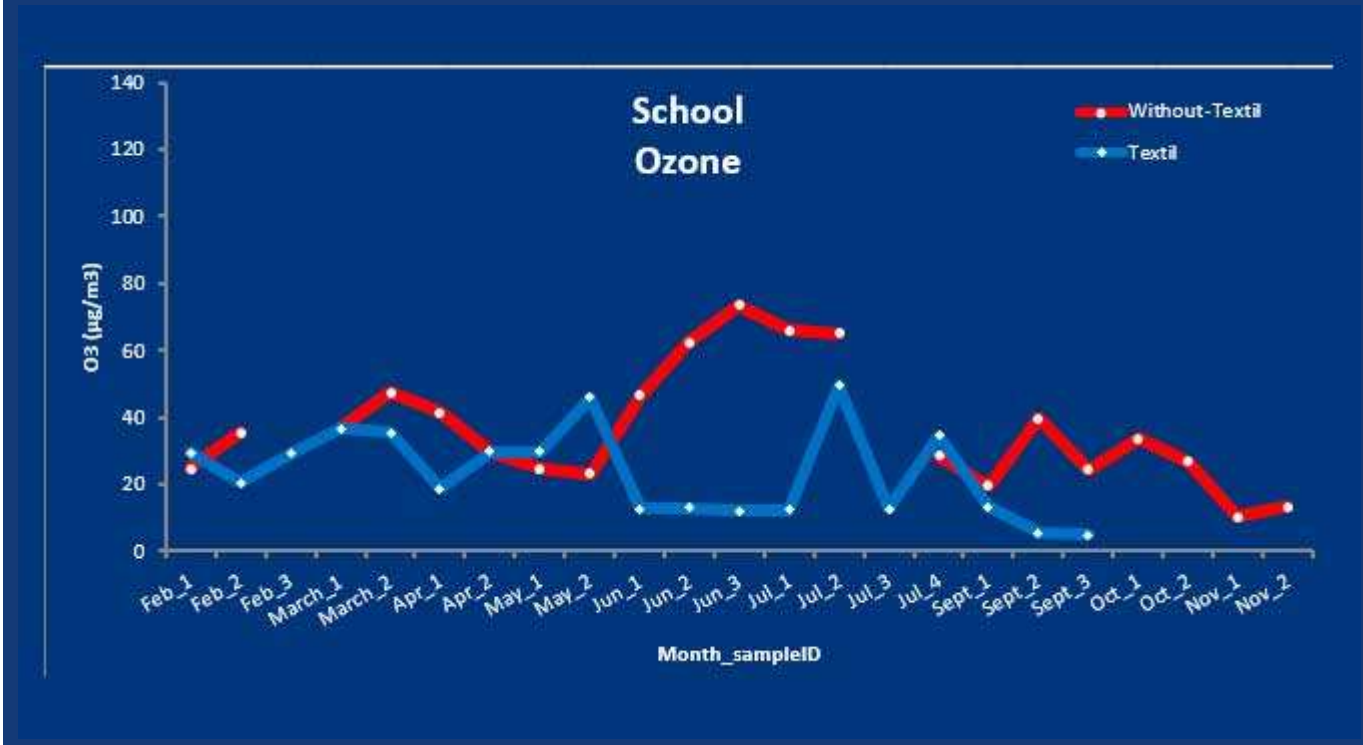


NOx comparison measurements with and without the photocatalytic fabric: Quart de Poblet (A3 Tunnel)

- Results verified by additional air-quality measuring tests:
The above decontamination results coincide with those observed during air quality measuring campaigns which were carried out using a wide variety of instrumentation including monitors and active samplers, to better understand the processes involved.

- Reduction in the ozone levels:

An additional reduction of ozone was reported near the awnings, which is a definite benefit to health given the irritation that ozone causes to the upper respiratory system.



It has been successfully demonstrated that the use of a photocatalytic compound on a textile substrate significantly improves the results previously achieved on other types of material such as cement and paint. The

implications for health and air quality are clear: the use photocatalytic textiles is an effective component in the fight to reduce NOx levels and should be combined with other, less popular measures such as reducing the use of private cars, lessening the severity of these unpopular measures on road users. We should be urging local authorities to adopt their use and adapt them to their plans for environmental improvement.

For more information visit the project website: http://www.ceam.es/PHOTOCITYTEX/home.htm

For further information:

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