

## COORDINATOR:



### Textile Research Institute AITEX

AITEX is a Spanish non-profit making private association formed by textile and related companies.

In the field of standardisation and quality, it has advanced testing laboratories: chemistry, physics and fire behaviour, that are authorised to award several certifications. AITEX participates in various EC initiatives, supporting the Spanish companies in the development of a growing number of diverse EU-funded projects.

AITEX has coordinated several LIFE projects such as:

- “The application of advanced photo-oxidation techniques in the treatment of residual waters in the Textile industry” (LIFEENV99/E/346).
- “Water Purification Tertiary Treatment using Photo-oxidation at semi-industrial scale” (LIFE03 ENV/E/000102).
- “Alternatives for waste volume reduction in the textile sector through the application of minimisation measures in the production process and in the consumption” (LIFE05 ENV/ E/000285) awarded as “Best LIFE Environment 2008-2009 Project” by EC and “Best Environment European Project of Valencian Community 2008 by Conselleria de Presidencia.
- “Risk reduction to public health from environmental sources using biotechnology in the textile sector” LIFE07/ENV/E/000794).
- “Demonstrative solutions to reduce noise pollution in industrial areas, using finishing technologies in textile materials” (LIFE09/ENV/ES/000461).

## THE CONSORTIUM:



Textile Research Institute AITEX  
[www.aitex.es](http://www.aitex.es)



UNIVERSITAT  
POLITÈCNICA  
DE VALÈNCIA

University Polytechnic of  
Valencia, Acoustic Department  
(Spain)  
[www.upv.es](http://www.upv.es)



Association of Textil  
Entrepreneurs of  
the Valencian region (Spain)  
[www.ateval.com](http://www.ateval.com)



PIEL, S.A. (Spain)  
[www.piel.es](http://www.piel.es)



Next Technology Tecnotessile  
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DEMONSTRATIVE  
SOLUTIONS TO  
REDUCE NOISE  
POLLUTION IN  
INDUSTRIAL  
AREAS USING  
FINISHING  
TECHNOLOGIES IN  
TEXTILE MATERIALS

<http://noisefreetex.aitex.net/>

**Noisefreetex** began on the 1<sup>st</sup> January, 2011 to find demonstrative solutions to reducing noise pollution in industrial areas by using finishing technologies on textile materials. (LIFE+09 ENV/ES/461). The project is coordinated by AITEX and project partners are PIEL, S.A. (Spain), NTT Tecnotessile (Italy), The Valencia Polytechnic University (Gandía campus) (Spain) and the Association of Valencian Textile Manufacturers ATEVAL (Spain). The project will finish on the 31st December 2013.

## THE OBJETIVES

**Noisefreetex** aims to validate demonstrative solutions to reducing noise pollution in urban areas around industrial estates.

Textile finishing technologies are applied to sound absorption material. These textile-based solutions can then be used as construction elements in industrial plants, walls, floors, ceilings and noise barriers on public roads to minimize the impact of noise pollution.

The lighter materials obtained by the project will be more effective compared to the mineral wool typically used for industrial acoustic insulation, which will lead indirectly to reduced traffic pollution by reducing the use of heavier materials and the transport costs associated with their use.

## PROGRESS

During the first two years of the project, the requirements and specifications were defined relating to products likely to be used in construction applications to reduce noise pollution, especially in industrial estates close to urban areas. Existing commercially-available solutions were studied, including their advantages and disadvantages, in order to compile a complete dossier on the state-of-the-market.

It also defined the main properties of textile materials to try to improve their properties in the field of acoustic insulation. Once the materials had been defined, samples were purchased to allow a full characterisation of their acoustic properties and fire behaviour.

Then work was carried out on the selected materials by the following finishing processes:

- Electrospinning: three types of polymers are used: polyurethane, polyamide 6 and polyvinyl alcohol to allow the most appropriate coating to be selected for the textile substrate.



- Plasma: different gases are used to treat the samples with the aim of improving the finishing processes.
- Coatings: different resins (mainly polyurethane and acrylics) are used to increase the surface porosity.

**Currently**, work is being completed on the validation phase. In this phase, samples are being tested at three levels:

- Laboratory-scale testing was used with the first samples. The absorption coefficients, flow resistance, the thickness and density of each material were identified. All the materials were found to have the appropriate absorption coefficient.
- Second phase: two scaled prototype chambers (transmission and reverberation) were constructed at the Valencia Polytechnic University to validate the samples and identify their acoustic behavior; this avoided the need to use full-scale testing facilities which are around 10-12 m<sup>2</sup>. Similarly, prototype acoustic panels were built with different perforation patterns, as well as a transmission tube. First the tube is used to measure transmission and then to scale-up the chambers.
- In the final phase, two of the materials that performed best were tested in a real-life situation.

Work is also being carried out on the development of simulation software that will provide additional data depending on the results of the prototypes. With this software acoustic behavior simulations can be run with different materials and under different conditions.