



This project has been funded
by the LIFE+ program
call 2013(LIFE13 ENV/E/001138)



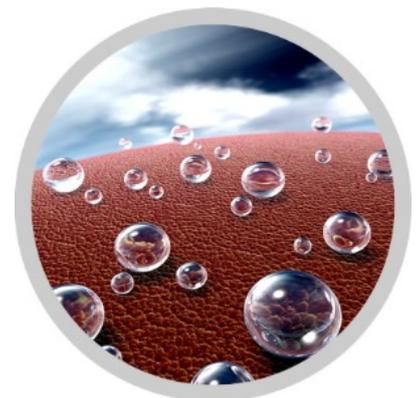
TEXTILEATHER

The **LIFE TEXTILEATHER** project, which started its activities on **1st June** 2014, is led by **ATEVAL** (the Textile Business Association of the Valencian Region) and developed by a Consortium of five partners, including **INESCOP** (Spanish Footwear Technology Institute) as Technical Coordinator, **CCI** (Cluster Calzado Innovation) – a cluster 44 Spanish companies -, the Italian tannery **Newport Srl** and the Spanish Textile Industry **TexAthenea S.L.**

BACKGROUND

In general, traditional finishing treatments that provide textiles and leathers with functional properties - such as **flame retardancy, water-proofing or antimicrobial properties** - involve the use of hazardous chemicals such as halogenated organic compounds, organophosphates, organic biocides, etc.

The use of which is currently restricted or under consideration in the European Union (REACH regulation and other EU legislation on biocides). Furthermore, significant water and energy consumption (both in liquoring baths and rinsing) is a special cause for concern. In addition, there are other important environmental impacts - such as air emissions of Volatile Organic Compounds and the production solid wastes and odours - which can be considered an undesirable by-product of certain traditional treatments.



AIM

The **LIFE TEXTILEATHER** project aims at demonstrating the feasibility of Multiple Laser Surface Enhancement (MLSE™) system - initially developed within the scope of metal industry - as a treatment able to provide textiles and leathers with functional properties.



This breakthrough technology results from the hybridization of high voltage, gas plasma combined with laser at atmospheric pressures, and it allows for the deposition of a very thin, although stable, layer of chemical precursors on the material surface. At present, the system is being successfully applied to wool fabrics intended for clothing and upholstery, in order to provide the material with hydrophobic and fire-retardant properties.

The MLSE™ technology is a continuous dry process enabling for significant reductions in the environmental impact of leather and textile finishing operations, compared to traditional processes.



This project has been funded
by the LIFE+ program
call 2013(LIFE13 ENV/E/001138)



TEXTILEATHER

As a result of the application of MLSE™ technology in above-mentioned finishing operations, water consumption is expected to be reduced by 75%, hazardous chemicals by 90% and energy by 10-15%, thus reducing waste generation when compared with traditional finishing systems.

As a result, a reduction in the textile and leather companies' environmental costs is expected. And last but not least, high added value textiles and leather materials will be obtained, which will provide the European industries with new niche markets.

EXPECTED RESULTS

MLSE™ technology will allow for the development of materials with performance enhancements including antibacterial, fire retardancy and water-proofing properties for the production of textile and leather materials. In particular, the following technical results are expected:

Fire/flame retardant properties:

- >Leathers and textiles for footwear and clothing with limited flame spread.
- >Textiles for domestic and other upholstery, Class 1.

Hydrophobic properties:

- >Leathers and textiles for clothing/casual footwear, water penetration time 30 min, water absorption $\leq 30\%$;
- >Leathers and textiles for waterproof footwear, water penetration time 180 min, water absorption $\leq 25\%$;
- >Leathers and textiles for footwear with oil repellency, at least Class 5;
- >Textiles and fabrics for upholstery with oil repellency, at least Class 5;
- >Textiles and fabrics for houseware with oil repellency, at least Class 4.

Antimicrobial properties:

- >Textiles for domestic and other upholstery with bacterial activity reduction $\geq 95\%$;
- >Leather and textiles for footwear and clothing with bacterial activity reduction $\geq 99\%$.

Finally, the durability of the treatment will be also assessed on finished products with the aim of demonstrating the feasibility of MLSE™ system for the intended uses.





This project has been funded
by the LIFE+ program
call 2013(LIFE13 ENV/E/001138)



TEXTILEATHER

PROGRESS

The following activities have been carried out during the first year of LIFE TEXTILEATHER project:

Selection of parameters to be optimised in the treatment of textile materials.

This task involved the selection of textiles to be enhanced with MLSE™ technology. Selected materials included fabrics more commonly used for domestic upholstery including: curtains, cushions, tablecloths, etc and footwear (linings, uppers, insoles, etc.). Taking into account the characteristics of these textiles, a series of fundamental parameters have been established for the adaptation of the MLSE™ demonstration plan.

Furthermore, the companies have set out the parameters to be finally met by the textile materials with regard to the different intended uses.



As a result of this action, the following **parameters** have been established for the subsequent adaptation of the MLSE™ system:

- >Fabric **structure**
- >Chemical **nature**
- >**Weight** of fabric
- >Material **dimensions** (width and thickness)
- >**Technical requirements** of functional properties
- >**Financial viability**
- >**Limitations** relating to the **production process**

Selection of parameters for the optimisation of leather treatment

The main activity carried out within this action has been related to the selection of leathers that will be MLSE™ treated and then used for the manufacture of footwear and other leather items. Taking into account the characteristics of these materials, the parameters for the adaptation of the MLSE™ demonstration plant have been set out.



This project has been funded
by the LIFE+ program
call 2013(LIFE13 ENV/E/001138)



TEXTILEATHER



As a result, the different considerations that will influence the adaptation of the MLSE™ system in subsequent tasks have been decided:

- > **The material dimensions** (width and thickness)
- > Leathers are discrete materials, and they do not allow working in a continuous mode.
- > Leathers are materials of animal origin (bovine, ovine, caprine...), and the type of leather should be considered for the optimisation of treatment parameters.
- > Requirements for functional properties to be achieved
- > Financial limitations
- > Other requirements: mechanical properties, breathability, durability, ...

Adaptation of MLSE™ technology for textile and leather treatment

Standard textiles and leathers have also been selected for the optimisation of the MLSE™ treatment for the different functional treatments to be achieved.

Process optimisation for textiles and leathers in the pilot plant

Promising results have been obtained so far. Functional properties have been achieved although the process variables are still to be optimised for the different materials under study.





This project has been funded
by the LIFE+ program
call 2013(LIFE13 ENV/E/001138)



TEXTILEATHER

Functional characterisation of textiles and leathers

Standard test methods to assess the functional properties of materials have been established, taking into account the final application of each type of material.

Socioeconomic and environmental impact assessment.

Preliminary indicators on the environmental assessment of MLSE™ hydrophobic treatment on textiles compared with the traditional finishing treatments show savings in energy consumption by 99% and (perfluorinated) hazardous chemicals by 100%, which in turn, implies a reduction of the carbon footprint impact by 90%.



DISSEMINATION EVENTS

Project progress was disseminated in several fairs and exhibitions related to the textile and leather industries, such as:

Heimtextil, Frankfurt (Germany), 14-17 January 2015.

SIMAC & Tanning Tech, Milan (Italy), 25-27 February 2015.

Co-Shoes, Elche (Spain), 22-23 April 2015.

TECHTEXTIL, Frankfurt (Germany), 9-12 May 2015

FORTHCOMING EVENTS

MICAM, Milan (Italy), 1-4 September 2015

HOME TEXTILES PREMIUM, Madrid (Spain), 17-19 September 2015

ITMA (International Textile and Garment Machinery Exhibition), Milano (Italy), 12-19 November 2015



For further information:

Project Coordinator: Mr. Felipe Carrasco felipe@ateval.com

Technical Coordinator: Mrs. Francisca Arán aran@inescop.es

www.textileather.eu