



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 59 Spanish companies -, the Italian tannery **Newport Srl** and the Spanish Textile Industry **TexAthenea S.L.**

## CONTEXT

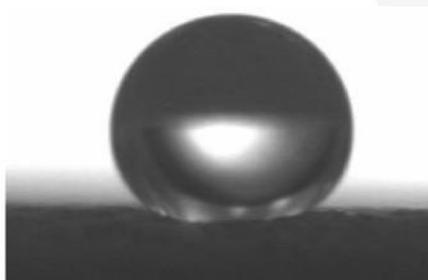
Currently, one of the main challenges that European textile and leather companies are facing is the introduction of more efficient and sustainable processes.

In this context, the traditional finishing processes intended to obtain functional textiles and leather, such as flame retardant, waterproof, stain- or antimicrobial-resistant materials, usually lead to the use of certain chemicals, such as halogenated organic compounds, organophosphorus compounds, etc., which are currently limited or restricted by European legislation. Also, the high humidity conditions of the process imply massive electricity consumption, and large quantities of water both in water baths and in subsequent cleaning processes. Other relevant environmental aspects include the emissions of volatile organic compounds, the treatment of effluents and the generation of solid waste and unpleasant smells, among others, that may imply relevant nuisance in certain processes.

## AIM

As a more environmentally sustainable alternative option, the **LIFE TEXTILEATHER** project intends to demonstrate the environmental and financial feasibility of the MLSE (Multiple Laser Surface Enhancement) technology, originally developed within the metal industry, to be used as a surface treatment for textiles and leather with the aim of providing them with functional properties.

**MLSE™ TECHNOLOGY:** It is a surface treatment based on the combination of different types of energy: laser and high frequency plasma, which in atmospheric conditions and in the presence of inert gases, (N<sub>2</sub>, O<sub>2</sub>, Ar and CO<sub>2</sub>) results in physico-chemical variations within the substrate surface at the nano-scale, providing a modest but consistent layer of chemical precursors on the surface of the material that confer functional properties on the substrate.



The MLSE™ technology can be described as a dry and continuous process, which can significantly decrease the environmental impact of traditional textile and leather finishing processes. The current production base is developed for the treatment of textiles; consequently, the treatment of other materials, such as leather, poses a great challenge.



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The kind of material, the capacity of the plasma, the power of the laser, together with the combination of gases employed and the nature of the chemical strongly condition the surface alterations on the material and, therefore, the functional features conferred.

## ACHIEVED RESULTS

### WATERPROOFING

#### - Leather and textiles with high hydrophobicity

The identification of some contact angles allows the wettability of a substrate to be measured, according to the interaction of said substrate with a water droplet. The greater the substrate repellence to the water droplet, the greater the contact angle of the droplet.

The materials processed via MLSE technology show contact angles greater than  $130^\circ$ , which means high hydrophobicity of the treated surface.

#### Waterproof leather for footwear for professional use (EN ISO 5403-1)

- Penetration time > 60 m
- Water absorption < 20%

The MLSE treatment does not significantly modify the water vapour permeability of the processed materials.



#### - Home textiles and upholstery with resistance to surface wetting (EN ISO 4920), up to **Spray Rate 5**

Textiles with resistance to surface wetting up to the highest spray rate (5) are obtained, which are assessed by the spray test method.

### STAIN RESISTANCE

#### - Home textiles and upholstery with hydrocarbon resistance. (EN ISO 14419), up to **grade 6**





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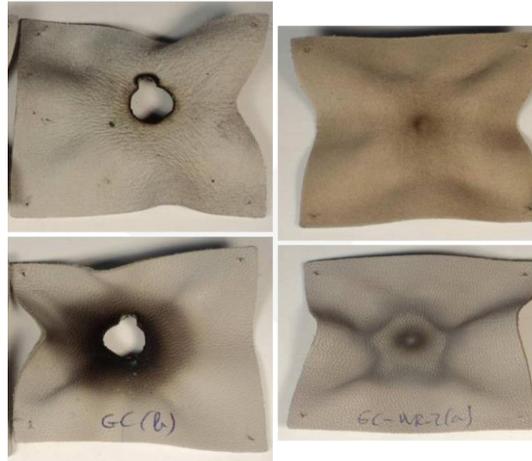
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## FIRE RESISTANCE

- Improved fire resistance of home textiles and upholstery



UNTREATED



TREATED

## IMPACT

By way of example, the first indicators about the environmental impact of “waterproofing finishing” in textiles, versus “traditional finishing” processes, have shown a significant decrease in electricity consumption by 99%, apart from a reduction in hazardous chemicals (PFCs) by 100%, which implies a reduction by 90% in the carbon footprint impact.

Similarly, in the case of the finishing process of leather with waterproof features, the application MLSE technology avoids the use of chemical compounds such as PFCs, resulting in a significant reduction in the environmental impact of the process. Additionally, the replacement of such compounds avoids the generation of effluents in the finishing process that must be treated by an authorised waste manager. Also, in the case of textiles, a considerable reduction by 90% in the carbon footprint of the finishing process is achieved.



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## OUTCOMES

Processing by MLSE technology represents an efficient and sustainable alternative to the current finishing processes for functional leather and textiles, which is to allow manufacturers to reduce the environmental impact of both industrial sectors, thereby contributing to the compliance with European legislation, which is becoming more and more restrictive.

The implementation of MLSE technology within the leather sector calls for the development of a specific system for the processing of discrete materials, which has been undertaken in the framework of this project.

### DISSEMINATION EVENTS

The Project was disseminated within different textile and leather trade fairs, including:

**Heimtextil** recently held in Frankfurt on 14<sup>th</sup>-17<sup>th</sup> January.

**LINEAPELLE/SIMAC Fair** held in Milan on 25<sup>th</sup>-27<sup>th</sup> February

**Co-Shoes** held in Elche on 22<sup>nd</sup>-23<sup>rd</sup> April

**TECHTEXTIL** held in Frankfurt on 9<sup>th</sup>-12<sup>th</sup> May.

**5<sup>th</sup> Freiberg Leather Days** held in Freiberg (Germany) in June 2016

**Man-Made Fibers >Congress** held in Dornbirn (Austria) in September 2016

**Home Textiles Premium Madrid** held in September 2016

### UPCOMING EVENTS

**Seminar “Towards more sustainable footwear”**. 18<sup>th</sup> May 2017, to be held in INESCOP, Elda (Alicante)

**Seminar “New standards –Textile development towards the fashion”**. 31<sup>st</sup> May 2017, to take place in *Círculo industrial de Alcoy* (Alicante)



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