

## CONCLUSIONS

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.

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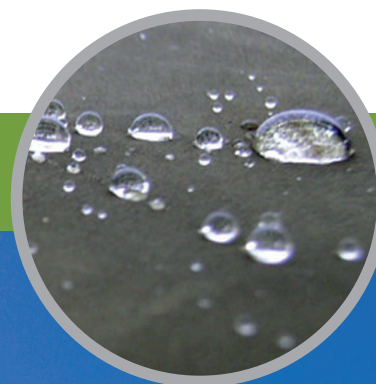


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TEXTILEATHER

## Functional textiles and leathers by innovative MLSE® process



This project has been funded by the European Commission through the LIFE+

**TEXTILEATHER-LIFE13 ENV/E/001138**



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The **LIFE TEXTILELEATHER** project is an initiative funded by the European Union through the LIFE+ Environment and Climate programme. The project 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), the Italian tannery **NEWPORT Srl** and the Spanish textile industry **TEXATHENEA S.L.**



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 that are currently limited or restricted by European legislation. Such processes also imply high energy and water consumption.

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.

As a more environmentally sustainable alternative option, the **LIFE TEXTILELEATHER** project intends to demonstrate the feasibility of the MLSETM (Multiple Laser Surface Enhancement) 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.

This technology can significantly reduce the environmental impact of conventional leather and textile finishing processes.

## ACHIEVED RESULTS

### WATERPROOFING

#### Leather and textiles with high hydrophobicity

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

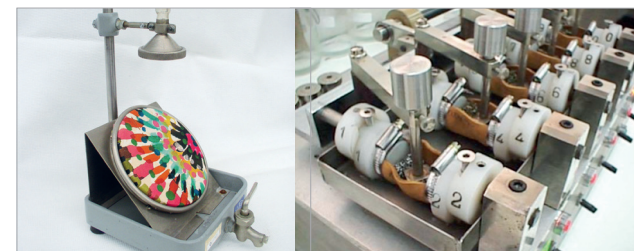
#### Waterproof leather for footwear for professional use (EN ISO 5403-1)

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

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

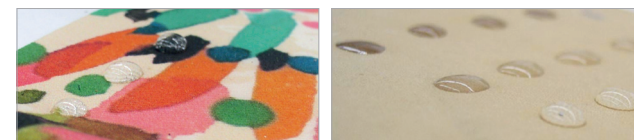
### Home textiles and upholstery with resistance to surface wetting (EN ISO 4920), up to Spray Rate 5

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



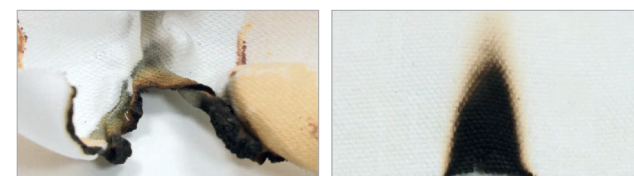
### STAIN RESISTANCE

Home textiles and upholstery with hydrocarbon resistance (EN ISO 14419), up to Grade 6.



### FIRE RESISTANCE

Improved fire resistance of home textiles and upholstery.

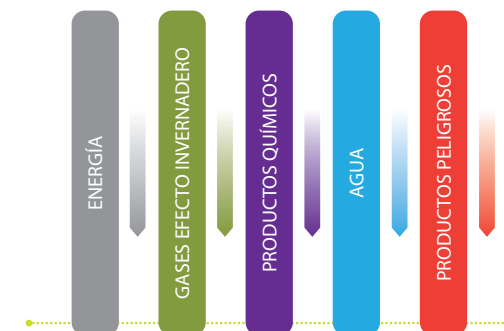


UNTREATED

MLSE TREATMENT

## Socio-economic and environmental 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.

The implementation of MLSE technology by European companies will contribute to the generation of qualified employment, thus contributing to the relocation of industrial activities back to Europe and the strengthening of economy.