The project has been financed by the European Commission through the LIFE+ program.
The main objective of WET-COMP is to evaluate and demonstrate that wet-laid technology is a useful common Procedure for Textile Wastes process in the manufacture of different types of non-woven materials from textile waste, revaluing the applicable in spinning and weaving/knitting fibres for being used as composites with technical subsectors and defining the different applications and at the same time reducing the need in composites sector. Another objective has been to validate the Previous R&D projects have shown that this enterprise benefits applying wet-laid technology technology is useful for obtaining some non-wovens to obtain textile reinforcements derived from textile wastes but the innovation of WET-COMP textile wastes. Has been: The project has contributed to the application of the To get a global vision for the textile/composites politics and community legislation regarding wastes sectors on the possibilities of this technology, and in particular the Directive on waste disposal and which wastes can be revalorizated, for which the frame directive on wastes, specifically in the technical application and which are the revalorization and wash-off reducing issues. Economical/ environmental benefits.

The aim of this document is to compile the results and conclusions reached by the European WET-COMP Project. This project was financed by the EC through the LIFE+ Program and developed by AITEX who acted as project coordinator in a consortium including AVEP (Asociación Valenciana de Empresarios del Plástico) y OMPG (Ostthüringische Materialprüfgesellschaft für Textil und Kunststoffe mbH).
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OBJECTIVES

The main objective of WET-COMP is to evaluate and demonstrate that wet-laid technology is a useful process in the manufacture of different types of non-woven materials from textile waste, revaluing the fibres for being used as composites with technical applications and at the same time reducing the need to wash off this type of waste. Previous R&D projects have shown that this technology is useful for obtaining some non-wovens from textile wastes but the innovation of WETCOMP has been:

• To get a global vision for the textile/composites sectors on the possibilities of this technology, which wastes can be revalorized, for which technical application and which are the economical/ environmental benefits.

• Within the project it has been also elaborated a common Procedure for Textile Wastes Revalorization using Wet-Laid technology applicable in spinning and weaving/knitting subsectors and defining the different applications in composites sector.

• Another objective has been to validate the enterprise benefits applying wet-laid technology to obtain textile reinforcements derived from textile wastes. The project has contributed to the application of the politics and community legislation regarding wastes and in particular the Directive on waste disposal and the frame directive on wastes, specifically in the revalorization and wash-off reducing issues.
INTRODUCTION

The project uses wet-laid technology. R&D projects have already shown that the technology is useful for certain textile waste-based non-woven textiles, but the innovative aspect was to create a global future vision for the textile and composite industries which considers the possibilities of this technology. It has demonstrated how the residue created by these industrial sectors can be revalued, by seeking applications which are economically and environmentally beneficial. The project also aims at developing a common procedure for the revaluation of textile waste using wet-laid technology applicable in the subsectors of spinning and weaving or knitting and define the different applications of the composites industry. It also aims to validate the commercial benefits of applying wet-laid technology to the manufacture of textile waste-based reinforcements for use in composites. Nonwoven materials obtained from the appropriate application of textile waste in wet-laid processes will be used as reinforcement in composites: several techniques have been considered.

1. Fiber swelling and dispersion
2. Suspension transport
3. Web formation
4. Water recycling

The wet-laid process
PROJECT DESCRIPTION

The development of WET-COMP initiative has implied in a first stage to identify and characterize a representative sample matrix of solid textile wastes suitable to be applied in wet-laid process. The different textile wastes have been selected depending on the different profile of the textile companies (spinning, weaving/knitting and the type of waste e.g. natural fibres, synthetic, etc.). Once finished this action, we have demonstrated that wet-laid process can be of interest for reusing and to give value to textile wastes code 04 02 22 (EWC) and packaging wastes code 15.01.01 (EWC). The non-woven materials obtained by means of properly application of textile wastes in wet-laid process have been used as composites reinforcement. Several composites manufacturing techniques have been considered to obtain the final products.

On the other hand, the development of this project entails also the establishment of a common methodology for the application of wet-laid technology to textile wastes revalorization. To this end, we have contacted representative enterprises from each of the textile spinning and weaving subsectors, with the aim of collecting enough information in order to be able to develop a common working procedure applicable to these sub-sectors. This document is based on several available technologies to treat solid textile wastes, on the investment that this acquisition means and on the wastes managing cost for being able to evaluate with actual data the economic advantages that the application of wet-laid technology would suppose. Results of the usage of this common wastes reduction methodology have been validated and demonstrated in the most representative spinning and weaving enterprises. This way we can ensure the procedures/guidelines to be perfectly adaptable and it helped us to further disseminate the results to other textile enterprises in a more successful way than if this practical demonstration has not been done.
MAJOR OUTPUTS AND RESULTS

WET-COMP Project has demonstrated that it is possible to find a new application for textile wastes generated by this industrial sector. A huge variety of non-wovens based on the implementation of this kind of wastes has been developed, performing a comparison among WET-COMP prototypes and commercial non-wovens in terms of physical and mechanical parameters. In this sense, non-wovens based on textile wastes are competitive in cost and also in mechanical properties.

75% SPINNING WASTES (VIS/COT/PET) + 25% PVA (6mm). 300 g/m²

Once obtained the non-wovens by means of wet-laid technology, these textile substrates have been employed as reinforcement of thermoplastic and thermosetting resins. In this sense, it has been evaluated the applicability of them in the following composites manufacturing processes: LFT-D and compression moulding. A wide variety of composite materials have been developed within this demonstration initiative.

Example of non-woven manufacturing: wet-laid facility at Aitex Headquarters.

PROTOTYPES PRODUCTION

LFT-D Process

Compression Moulding
CONCLUSIONS

The non-wovens developed by means of wet-laid technology are not applicable in LFT-D process. In this sense, it has been noticed that the use of thermoplastic binders in non-woven consolidation is negatively affecting the fiber dispersion into the thermoplastic matrix in LFT-D process. On the other side, the use of non-wovens based on textile wastes as reinforcement of composite materials for thermoforming or compression moulding processes has been successfully demonstrated. The mechanical characterization of composites reinforced with this type of non-wovens has pointed out that similar properties compared to commercial products are obtained in composite products by employing textile reinforcements generated with industrial wastes as short fiber, selvages, spinning dust, etc.

Within WET-COMP Project a General Procedure for the revalorization of textile wastes by means of the technological strategy above mentioned has also been developed.