
ECOFORMALTEX 00 FORMALDEHYDE-FREE ECO-FINISH FOR TEXTILES

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CDTI / EEA-GRANTS



1. MOTIVATIONS FOR THE PROJECT (REASONS FOR THE STUDY).

The company ADRASA base its strategy on searching differentiating elements, as product quality and a continuous researching line for new products and processes for the textile industry, in order to find new solutions.

The invest growth in R&D projects is continuously increasing, being a leading company in this sector and field. The management in this R&D Project points out the importance of focussing on customers necessities, which are identified in sales department, and the ability of obtain a solution through researching by qualified workers in the facilities.

ADRASA is a Company committed with environment and health, facing the problems as opportunities to develop new products in order to reduce the risk for environment and people, and fulfilling the correspondent standards.

The society is focussing their efforts in protecting people from hazardous toxic chemical substances and finding new solution that avoids the use of these products. Therefore, in this context the company started off this project in order to solve a specific health and environmental problem in textile manufacturing.

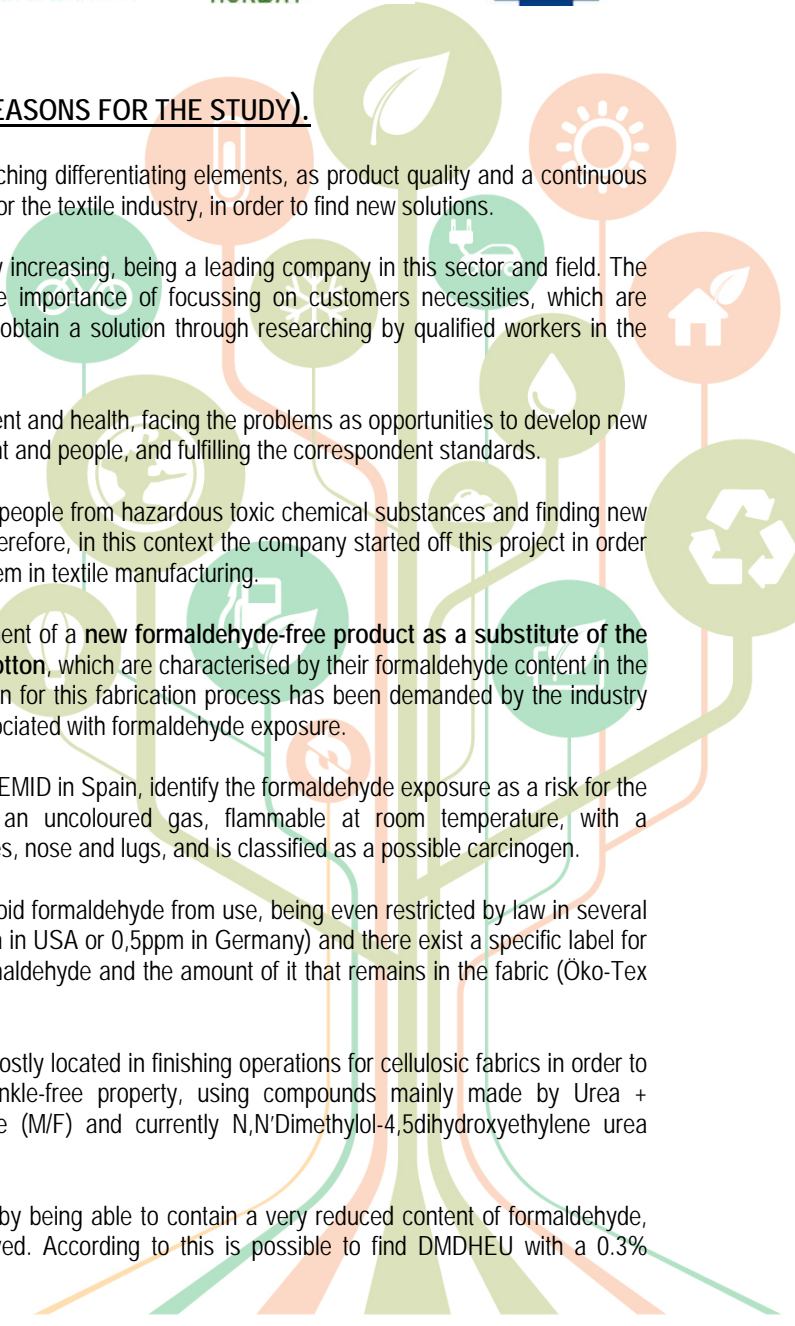
The project carried out consisted in the development of a **new formaldehyde-free product as a substitute of the current solutions in wrinkle-free finishes for cotton**, which are characterised by their formaldehyde content in the formulations. Avoiding formaldehyde in formulation for this fabrication process has been demanded by the industry and customers because of all the health risks associated with formaldehyde exposure.

Medical institutions and official organisms, as DIGEMID in Spain, identify the formaldehyde exposure as a risk for the health. This substance, the formaldehyde, is an uncoloured gas, flammable at room temperature, with a characteristic smell that may cause irritation in eyes, nose and lugs, and is classified as a possible carcinogen.

Because of all this reasons, the tendency is to avoid formaldehyde from use, being even restricted by law in several countries, including limits in work places (0,75ppm in USA or 0,5ppm in Germany) and there exist a specific label for textiles in which is informed about the use of formaldehyde and the amount of it that remains in the fabric (Öko-Tex Standard 100).

The use of formaldehyde in textile processes is mostly located in finishing operations for cellulosic fabrics in order to feature them with a durable and resistant wrinkle-free property, using compounds mainly made by Urea + Formaldehyde (U/F), Melamine + Formaldehyde (M/F) and currently N,N'Dimethylol-4,5dihydroxyethylene urea (DMDHEU).

DMDHEU is the most used and is characterised by being able to contain a very reduced content of formaldehyde, but that little content can't be completely removed. According to this is possible to find DMDHEU with a 0.3% formaldehyde content.



Currently, the responsibility of removal formaldehyde from the work place in factories belongs to the company, which must act taking into account the risks and legislation. Therefore, with this project ADRASA has developed a real solution for the industry, and achieving the complete removal of formaldehyde and all the risk related (health and environmental), which has been the main motivation for this project.

On the other hand, this project has been also carried out for commercial and strategic issues, taking into account the impact in the market of the new formaldehyde-free formulation and the added value that generates, not only for the industry, also for the final users or customers. The new product transmits to the users that the fabric has not been processed under a dangerous chemical product, as formaldehyde, and this information can reach the users thanks to Öko-Tex Standard 100, which implies an specific label with the levels of formaldehyde.

Although the main reasons for the project are related with solving the environmental and health problem, since the removal of formaldehyde from formulation means a health and environmental improvement in the manufacture process and in the use of the final product.

2. OBJECTIVES.

ADRASA undertakes this project to develop a less harmful process for environment and health in wrinkle-free finishes for textiles, being **the complete removal of formaldehyde in this process the main goal**.

The project has been divided in two milestones. In the first one, the project was developed in the right direction in order to obtain an alternative formaldehyde-free compound, studying the different alternatives and balance the advantages and disadvantages. In the second milestone, the new compound was tested on cotton fabrics in order to determine the effectiveness and the efficiency.

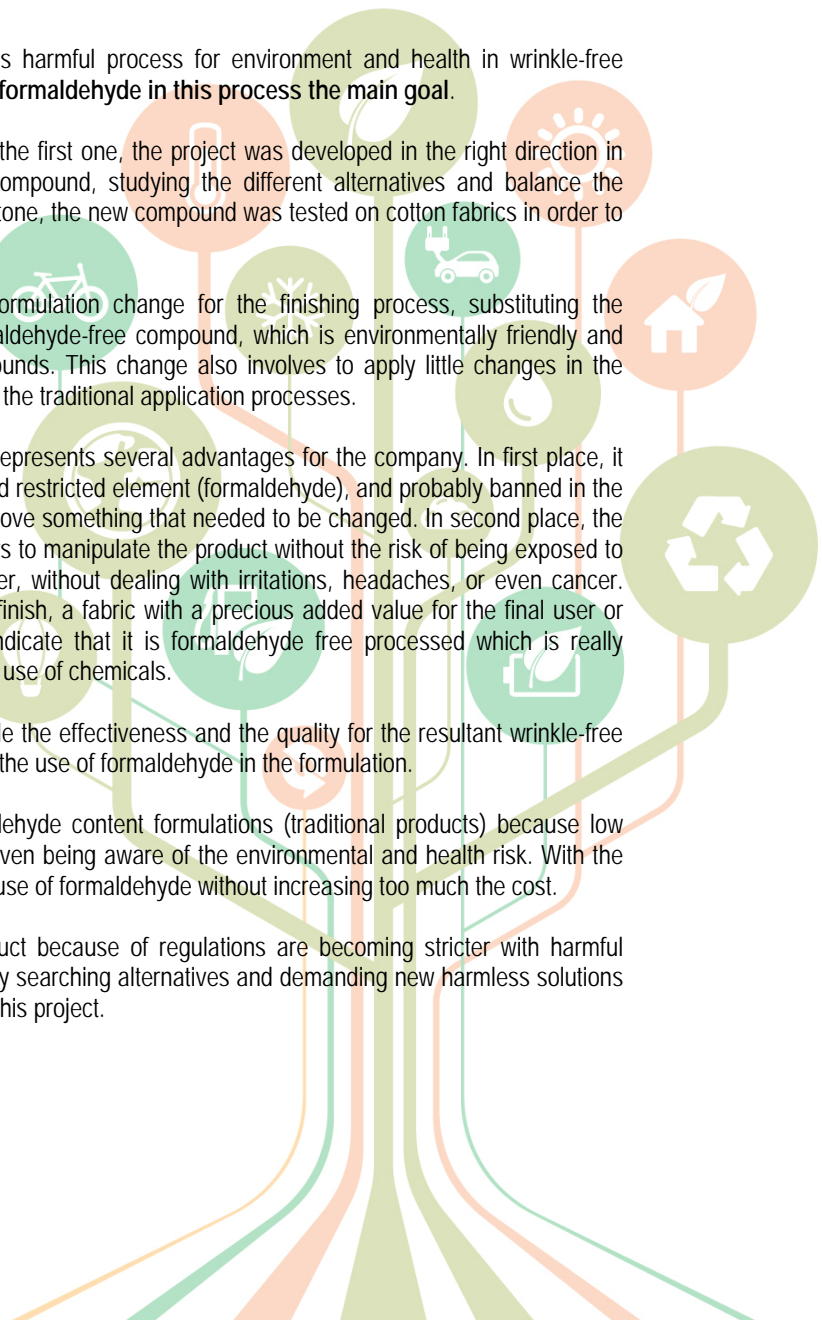
The technological innovation was presented as formulation change for the finishing process, substituting the formaldehyde content compound for the new formaldehyde-free compound, which is environmentally friendly and effective enough to compete with traditional compounds. This change also involves to apply little changes in the applying process, although is mostly compatible with the traditional application processes.

The alternative compound purposed in this project represents several advantages for the company. In first place, it allows the company to avoid the use of a harmful and restricted element (formaldehyde), and probably banned in the future. Therefore, it represents an adaptation to improve something that needed to be changed. In second place, the new formaldehyde-free compound allows the workers to manipulate the product without the risk of being exposed to a dangerous substance, making the workplace safer, without dealing with irritations, headaches, or even cancer. Finally, once applied the product for a wrinkle-free finish, a fabric with a precious added value for the final user or customer is obtained, because the labelling will indicate that it is formaldehyde free processed which is really appreciate in a concerned society with the risk of the use of chemicals.

At technical level, the new product needed to provide the effectiveness and the quality for the resultant wrinkle-free finishing process, keeping the features and avoiding the use of formaldehyde in the formulation.

It is known that companies are using high formaldehyde content formulations (traditional products) because low formaldehyde content formulations are expensive, even being aware of the environmental and health risk. With the new developed product will be possible to avoid the use of formaldehyde without increasing too much the cost.

High sales potential is expected for the new product because of regulations are becoming stricter with harmful chemicals. Consequently, the industry is continuously searching alternatives and demanding new harmless solutions as the new formaldehyde-free product developed in this project.



3. OBTAINED RESULTS

The research and the developed product in this EEA-Grants project provides a completely formaldehyde-free solution for wrinkle-free finish for cellulosic textiles and, at the same time, it is a viable alternative for the current products in the industry.

The advantages or improvements provided with this new product include the total removal of formaldehyde and the harmful effects related, and consequently an important improvement in the workplace in factories, where workers could be no longer exposed to formaldehyde. The environment is also protected, avoiding release formaldehyde to the atmosphere or wastes with formaldehyde content. Moreover, another advantage involved with this new formaldehyde-free product is the economic viability regarding products with low rate formaldehyde content, as DMDHEU, which increases the cost because more product need to be applied. The residual acidity is another problem with low formaldehyde content products, which deteriorate the fabric.

The new formaldehyde-free product is therefore, a health beneficial solution, environmental friendly and can be economically attractive as alternative.

The new product developed is presented as an effective and viable alternative, avoids the presence of a harmful chemical in the workplace and in the final finished fabric and is environmental friendly. It fulfils with the goals purposed to achieve in this project and is high compatible with the traditional processes of application used by the industry.

The industry will be able to take benefit of changing toward this formaldehyde-free product. On one hand, the benefit of get rid of a chemical element (formaldehyde) which is harmful, restricted and it is likely to be banned in the future. On the other hand, the benefits of remove formaldehyde from workplaces, avoiding employees to manipulate a product that produce irritation in the skin, mucous, lugs, produces headaches and it is classified as a possible carcinogen. Finally, this formaldehyde-free product provides and added value in treated fabrics because their no presence of formaldehyde will be indicated in a label (Oko-Tex Standad 100) and noticed and appreciated by the users.

