

# Optimization of the design phase and the End of Life scenarios of Textile Façade Retrofit interventions

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## ABSTRACT

Despite the advanced age of the European building stock, the expectation towards their service life is still long. Therefore, it is of the utmost importance that these constructions undergo re-qualification in order to comply with the upgraded building performances. With the spread of temporary constructions and multi-use buildings, existing constructions must exploit their resilient potential, taking advantage of durable, lightweight and innovative materials. Considering that a building unit has a longer life than the one of its components, for evaluating its effective environmental impact also the necessary refurbishment interventions must be taken in consideration. Indeed, even when these are limited to just a portion of the building, they could have a significant impact on the building throughout its entire Life-Cycle.

Membranes, thanks to their intrinsic properties, present high advantages and potentials in façades applications, unveiling great potentialities in retrofit solutions and temporary interventions. In order to gain relevance as valuable materials for façades retrofit scenarios, their environmental impact must be analyzed even throughout the Life Cycle related to a retrofit intervention and their End of Life must be optimized accordingly in order to minimize the impact and favoring lightweight replacements.

This paper analyzes the use of textiles in different façades retrofit interventions, focusing on the optimization of the design phase and the End of Life scenarios in order to identify the optimized parameters for a most effective solution. The study addresses manufacturers towards the optimization of the product, as well as designers for a proper application of the material in façade retrofit scenarios. The outcome of the analysis is to validate the use of textiles for this kind of applications, showcasing the potentialities of these materials both in case of first life as well as re-use and recycling applications.

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