



POLITECNICO  
DI TORINO

# Honors thesis

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ARCHITECTURE FOR THE SUSTAINABILITY DESIGN

*Abstract*

**ReCashplaster Recycled Cashmere for plaster  
Development of textile waste for new architecture materials**

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This thesis presents a sperimental work, that uses industrial textailis trash from Biella area, in order to design new sostenibile materials for architecture. The research has been carried out on the performance of the plaster after adding textile waste, impicmenting a circular economy view.

One of the main objectives was the cration of a new spinneret which, following the idea of circular economy, could create value from waste.

The first analysis, focuses on twenty industries divided into different production typology, has identified textile waste. Thanks to a data acquisition questionnaire and a flow chart many different, it was possible to identify the different processes steps, the typology of waste, the quantity and origin of waste.

Part of this waste is sold, however the processed dust, in form of micro fibers are organized in a rectangular bales or cylinders and they are destined to landfill.

On an international level it can be observed that a lot of similar waste products were used into malts as aggregates or additives in order to increase the final performace of the product.

In collaboration with Vimark company, it was possible to create a selection of three different types of waste, one from fraying process (SF), another in the mixing phase (Misto) and finally a dust waste from Lanificio Piacenza which is made from wool and cashmere (L/C).

The mandatory required by the legislation have been performed with a premixed basic plaster made of cement, aerial lime and two different percentages of the selected waste (0.25 g/Kg – 5 g/Kg). The final results were compared with the basic plaster and the fiber plaster that is currently produced by the company.

The tests with 0.25 g/Kg of textile dust, the same percentage that the company uses for their fiber plaster, do not show an increase of features to justify its insertion, because the data are similar to plaster without fibers.

The tests with 5 g/Kg of textile dust, in particular for wool/cashmere (L/C) waste show an substantial increase of performance, the adherence doubles compared to the base plaster and fiber plaster, also the mechanical resistances are considerably greater. The fraying process (SF) and mixed (Misto) waste require adding 2% of water and they have the tendency to form lumps.

Finally it can be assessed that textile fibers, in particular wool/cashmere, brings benefits within the plaster, creating ReCash<sub>plaster</sub>, a plaster with aerial lime, cement and natural textile aggregates in accordance with European laws and with regulation 998-1.

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