

Re-manufacturing textiles within circular economy: trials of closing the loops of Textile-based Tertiary Architecture

Alessandra Zanelli* e

Carol Monticelli*

* ABC Department, Textile
Architecture Network,
Politecnico di Milano
Via Ponzio 31, 20133 Milan, Italy e-
mail: alessandra.zanelli@polimi.it

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ABSTRACT

The paper focuses on the peculiarities of the typical design-to construction process of textile building systems that today have been mainly used in tertiary architecture.

The so-called textile architecture or membrane architecture is a niche of construction where durable materials are mostly applied for temporary uses.

The time-span of textile architecture may widely vary whether the textile artefacts are designed for interiors or for outdoor installations. On one hand, textile-based architectural products shall include ceilings, movable partitions, curtains and even more innovative self-standing detachable and modular walling systems. Their application in tertiary architecture sees very short cycle of installation and renewal. Typically, the first service life of textile products in interior architecture is ranging from one to five years.

The latter open-air application shows even wider time-span, from few days (ephemeral uses), or few months (seasonal purposes) up to 10 years (long temporary functions). The main uses are ephemeral mobile pavilions, seasonal sport halls, as well as tensile membrane structures for public events and coverings for exhibitions or fairs.

The Design for Re-manufacturing (DfRem) approach is always intrinsically inherent to the textile-based building artefacts. Independently by the functionality, textile architecture foresees dry and reversible installation methods, that are the basic approach for any further transformability of building artefacts.

Despite of the shortage of their use, the durability of membrane products (fabrics and foils) is ranging from 25 to 30 years. Considering the typical long-lasting, petrol-based, composite nature of current architectural membranes, it's worth to promote their reuse, renewal and re-manufacture in further installations, after their first temporary service.

Short-time architectural functionality and long-time durability of materials are added values for the re-manufacturing of tertiary architecture.

Textile-based products have a widespread use in tertiary architecture, thanks to their lightweight, easy handling in the installation phase and a general design-to disassembly potential. Nevertheless, their DfRem attitude and their real re-manufacturing practice need to become more effective and wide-spread, after the first service life.

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