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Alive dynamic covers

Thinking of the term "cover" as a skin of the building, an element of separation between the outside and the inside, contemporary architecture, following the principles of sustainability, rather proposes a series of envelopes - "covers" - under which the building is hidden. With the function of acoustic, thermal and shading protection as well, these translucent skins like onion leaves hide the core of the building, filter natural light, also mediating a more gradual transition from the public space to the private, intimate space of a home, for example.

Looking around, a number of buildings with low energy performance have been built that consume significant amounts of non-renewable resources, disregarding traditions and the climate context. Thus, in the current context, the state of comfort is increasingly difficult to achieve in interior spaces without a significant contribution of heating, ventilation and air conditioning installations. The thin layer that separates the interior from the exterior, lacking the thermal inertia and shading systems necessary to ensure an optimal interior climate in the context of weather changes, exposes the intimate life of the interior to passers-by.

In the doctoral thesis "Envelope optimization for energy-efficient office buildings" I addressed the increasingly important topic of the need to find optimal solutions for the problems related to the low energy efficiency of the building envelope, arguing that the limitations of existing facade solutions can only be overcome by moving from static systems to adaptive systems that respond dynamically to changes in the internal and external environment parameters and that include renewable energy sources. The sustainable use of materials and resources in the built environment maximizes the life time of building components and materials, as a strategy to avoid the moral wear and environmental impacts and costs regarding energy and materials consumption.

In this regard, the building envelope must be dynamic like a living organism, for example facades with several air cushions that can inflate or deflate, mobile shading systems, panels with algae bioreactors, etc. which can regulate the amount of heat and light entering the interior space of the building and in addition provide an exterior image in continuous transformation, corresponding to the current need for continuous transformation and visual stimulation.

Beta Awards



Figure1 – Collage – curtain wall, mobile shading, air cushions and algae bioreactor