

Honors Thesis

Master of Science in Sustainable Architecture

Abstract

Interactive Anthropocene-Aware Building Envelope -Investigating Plastiglomerate as a Semi-Synthetic Material

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Plastiglomerate is the first physical marker inscribed in the geological record, forever indicating our presence, called the Anthropocene era. The human species have only recently been aware of the severity our impact has on climate change, on a global scale. Nonetheless, this awareness is until now only limited to conferences and promises. People have yet to change their habits, and demand for action.

In order to mitigate this existential issue, this thesis investigates the use of Plastiglomerate as an experiential novel material in architecture as a means of awareness. It is made through a rainscreen application on an impactful existing building in Turin.

Progressively, this thesis studies the implications that proposition entails. The foundations are set by defining the Anthropocene as a Hyperobject, a term first coined in 2008 (Morton, T., 2013), hence categorizing the Anthropocene as a topic of immense scale that is difficultly grasped. The position of consciousness is then discussed ranging from our daily practices to major wonderment.

Artists acting as activists have always been at the forefront of exacerbating engagement with the viewer. Therefore, the different means design could radiate awareness on this topic is studied. Following the artists, architects express their concerns and use different tools and techniques through design philosophies, and experimental material uses, notably at the envelope level.

Extensive research is done on plastic properties as a building material. This is followed by two scientific case studies of plastic waste-based composite materials, solving specific regional or global issues, such as the scarcity of sand used in the construction field and reusing landfill bound plastics.

With Plastiglomerate being a locally supplied material, Turin's plastic waste is inspected within Italy's plastic waste stream. Therefore, the quantity and type of un-recycled plastic that would be saved to create the heterogeneous material is estimated.

The Material Driven Design (MDD) method created by Karana, E. et al, (2015) is a tool for creating new materials' vision, not only considering their functional use, but acknowledging their experiential importance. With this process can emerge Plastiglomerate's intended goals and considerations for the prospective rainscreen. The method also entails a comprehensive observation of previous designers' experiences with this material.

Finally, these considerations culminate in a hypothetical application of the Plastiglomerate rainscreen on the Torre Littoria located in the heart of the city of Turin, via a ventilated facade system application.



