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Project Zero

Explorative interrogation of material and fabrication processes through zero waste chair design.

An exegesis presented in partial fulfillment of the requirements for the degree of Master of Design

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Figure 1 The studio space during the project.

GREEN UMBRA
LIFE-CYCLE ANALYSIS
MATERIAL PROPERTIES
MATERIAL CHOICE
MATERIAL PROPERTIES

SYNTHETIC MATERIALS

LIFE-CYCLE ANALYSIS
MATERIAL CHOICE
MATERIAL PROPERTIES

"The details are not the

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Abstract

Project Zero is a response to the volume of waste produced in the fabrication of timber furniture. It joins the 'zero waste' movement that has been adopted by progressive thinking communities worldwide — which share a common interest in resource conservation (Connett, 2006; SF Environment, 2011). While zero waste philosophies address all aspects of material life cycles, zero waste design fundamentally seeks to prevent waste in the creation of a product, thus eliminating unnecessary resource consumption from the outset, through design.

In this practice-based research project, a zero waste chair is designed through an explorative reiterative process, where materials greatly inform new technologies, aesthetics and form. Materials not only influence the physical attributes of the chair, but also shape how it is experienced (Karana et al., 2014). Through visibility of material and fabrication processes, the Pare occasional chair communicates a design story of a zero waste life cycle.

The central innovation of the research is the development of a new zero waste composite material, made from mycelium and timber veneer. It is the result of an extensive interrogation of material manipulations and fabrication processes. The mycelium material, which is grown using waste wood shavings and live fungi, is programmable and can be moulded or pressed. The veneer, rather than being layered into a sheet product then machined, such as with plywood, is first shaped using zero waste pattern cutting inspired by textile processes. The shaped veneer is then laminated with the mycelium into compound curves, eliminating the need for post-processing.

This research extends the emerging discourse around zero waste design. In particular, it offers a critical design response to 'zero waste' chair design using timber products. The resulting design proposition is positioned as a prototype for an iconic zero waste chair. Subsequent research beyond the scope of the current project would facilitate commercial application of Pare. Furthermore, the research findings around zero waste material innovation offer opportunities for the advancement of material conscious design and fabrication for other zero waste products.



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Aims and Research Objectives

My primary aim is to explore and develop an innovative material and fabrication process for zero-waste chair design.

My secondary aim is to produce a prototype of a zero waste chair design concept. This prototype should communicate an understanding of the relationship between chairs and zero waste design. The ultimate goal is to design a chair that represents the zero waste movement — an icon of zero waste design.

Beyond the scope of the current research project, I aim to explore other applications of the material and fabrication technologies I develop. My hope is that these innovations will have potential beyond furniture and will advance zero waste design for the consumer market.