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MDES Project Report: Watermakers – Desalination and Hydration at Sea

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ABSTRACT

In this exegesis the term Watermaker has been used to describe a survival product that creates fresh potable drinking water from saltwater.

Of all the water on the earth ninety seven percent of it is saltwater. Of that three percent that is fresh water only point five percent is of a quality safe enough for drinking (Kim, Hee Ko, Kang, & Han. 2010).

When a person is stranded on a life vessel or in a situation where freshwater is not readily available, a survival product that produces fresh water has the possibility of prolonging the life of that person. Designing a product that provides fresh water and thus preventing the dehydration of someone in a survival situation was the aim of this project.

The final product meets the design criteria of being energy efficient and easy to use. By achieving this, the end user is provided with a product that is immediately usable and requires a low expenditure of energy when in use. Product testing and usability studies were carried out during development to ensure that the design criteria were fulfilled.

Research revealed that there is a need for a product of this kind that sits in the more affordable end of the market. Design challenges involved creating a product that requires minimal parts and keeps manufacturing costs low. Achieving this resulted in a more affordable option to the consumer, with the intention of making them more inclined to purchase the product that may some day save their life. Furthermore, low cost can open up opportunities in markets that would otherwise have been precluded by price sensitivity, such as in developing nations.

Of the two main desalination processes in use today (reverse osmosis and distillation), distillation was chosen as it offered more affordable design

options and production methods. This product is unique in its function of using the sun's energy to gather water through condensation. Utilising the sun's energy to generate fresh water made this product more suited for warmer climates; however testing showed it was still productive in cooler climates.

A product of this nature could be used in any situation where fresh, potable water is required – not just survival circumstances. With water shortage and quality becoming a global concern this product offers a low cost, easy to use option for producing drinking water. Over 80% of the global third world population is situated within the tropics. The low cost of this product coupled with the warmer temperatures found in the tropics means this product is ideally suited for use in developing nations.

ACKNOWLEDGEMENTS

This project would not have been possible without all the help and support I have had from my family and friends. I have had a great amount of support from people in the industry who have assisted me in sourcing materials and components for the model making section of this project.

I would like to thank my supervisor Azhar Mohamed for his continued guidance with this project. Azhar helped drive this project and was a great influence throughout. I must acknowledge my partner Amanda Old who has put up with me throughout this challenging project. My parents also deserve a huge thank you for their continued support and encouragement.

I would like to give a big thanks to Neil Murray and Chris Kitchen for their contribution to this project. Finally I would like to thank all the lecturers and staff at Massey University who have helped in any way throughout my studies. Every comment and piece of advice was much appreciated and considered throughout this project.

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