

## The Study of Wicking Performance of Viscose Bamboo Knitted Fabric In Seawater Desalination Process

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### Structured Abstract

**Background:** Seawater Desalination is one of the modern method in conjunction to elucidation in national water crisis especially with limited fresh water access countries such as middle east and Singapore. Desalination membrane transfer uses stretchy knitted fabric. Bamboo woven membranes are being developed to extract salt and minerals from saltwater. Small threads make these membranes water-permeable but not other molecules. Bamboo fiber desalination membranes have strong mechanical strength, chemical resistance, and water permeability. Desalination solutions are sought due to population expansion and freshwater demand.

**Methods:** In this study, three samples have been created using v-bed knitting loom. Different structures consists of Plain single jersey, Rib 1x1, and Rib 2x2 are the independent variables of this studies. Creation of artificial seawater was created through mixing if a few chemicals accordingly to the standards. Followed with Fiber identification to identified the originality of the fiber. Next, the fabric was test on thickness and weight using electronic balance and thickness gauge. The density of the fabric later was identified using counting glass for Course per Inch and Wales per inch. To achieve the objective of seawater desalination on rate of water transfer using Vertical wicking and Horizontal wicking test. The test was concluded using pH test to analysed on the outcome after desalination using the samples.

**Results:** The results showed that the rate of water transfer on fabric samples Plain, Rib 1x1 and Rib 2x2 are highly affected on the loop length of the samples. Plain has the lowest loop length, followed with Rib 1x1 and Rib 2x2 has the highest loop length. The higher the loop length of the fabric samples the higher the water rate transfer. This is due to the empty spaces in the fabric allows more water to be kept and transfer from one point to another. In addition, the pH value results show that Rib 2x2 has the highest difference between initial pH value and final pH value which indicates the samples able to reduce to pH value close to freshwater. Meanwhile, sample fabric Plain has the lowest pH difference followed with Rib 1x1.

**Conclusion:** Knitted fabric Rib 2x2 was found to be an effective desalination knitted fibre construction compared to plain single jersey and Rib 1x1. Which is supported from the results of high transfer rate and high reduction of pH value of artificial seawater. This study can be useful for developing eco-friendly and cost-effective methods for the process of seawater desalination into freshwater.

**Keywords:** Seawater Desalination, Bamboo fiber, Knitted Fabric, Plain Single Jersey

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