

Upcycling of used surgical masks into constructible ceramic floor tiles

Charlotte Valerie Liem ¹, Claretta Loryn Ong ², Drizelvexio Delciello Winokan ³, Kimzy Fortunio Karanth ⁴, Miquel Ezequiel ⁵

1. Charlotte Valerie Liem, Xin Zhong School, Surabaya, Indonesia (312220981@xinzhong.sch.id)
2. Claretta Loryn Ong, Xin Zhong School Surabaya, Indonesia (312220986@xinzhong.sch.id)
3. Drizelvexio Delciello Winokan, Xin Zhong School, Surabaya, Indonesia (312220994@xinzhong.sch.id)
4. Kimzy Fortunio Karanth, Xin Zhong School, Surabaya, Indonesia (312221032@xinzhong.sch.id)
5. Miquel Ezequiel, Xin Zhong School, Surabaya Indonesia (312221046@xinzhong.sch.id)

Abstract

Surgical mask is now considered as one of the primary remnants of Covid-19 pandemic. Though its impact is no longer felt as strongly nowadays as it was 2 years ago, the possible repercussions of it are alarming. One of the materials that make up a surgical mask is polypropylene. This hydrocarbon polymer takes a very long time to finally degrade and as it does so, it releases certain amounts of toxic substances during the process. A good number of studies have already been conducted to address this dilemma such as degradation using bacteria and recycling its polypropylene fibres into fabric. Another viable solution to mitigate this face-mask waste while still taking into account its possible usefulness is to incorporate it into ceramic tiles. Having been affected by the said pandemic, the ceramic industry has experienced tremendous losses in terms of production. This study sought to investigate the right percentage of shredded surgical mask to be added into the ceramics tile to improve its mechanical strength. The measured strength obtained a mean value of 277N as compared to the control (pure) ceramic tiles that acquired a mean value of 253N which accounts for a 9.49% increase in terms of mechanical strength.

Keywords: ceramic tiles, polypropylene, surgical masks