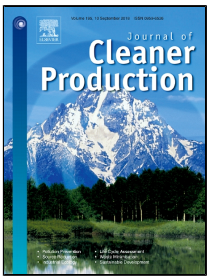
Accepted Manuscript



A comprehensive review on mechanical and durability properties of cement-based materials containing waste recycled glass

Suvash Chandra Paul, Branko Šavija, Adewumi John Babafemi

PII:	S0959-6526(18)32068-7
DOI:	10.1016/j.jclepro.2018.07.095
Reference:	JCLP 13549
To appear in:	*Journal of Cleaner Production*
Received Date:	26 March 2018
Accepted Date:	09 July 2018

Please cite this article as: Suvash Chandra Paul, Branko Šavija, Adewumi John Babafemi, A comprehensive review on mechanical and durability properties of cement-based materials containing waste recycled glass, *Journal of Cleaner Production* (2018), doi: 10.1016/j.jclepro.2018.07.095

Revised manuscript submitted to ***Journal of Cleaner Production***

Total word count: 10955

A comprehensive review on mechanical and durability properties of cement-based materials containing waste recycled glass

Suvash Chandra Paul[1], Branko Šavija[2, *] and Adewumi John Babafemi[3]

[1]Civil Engineering, Monash University Malaysia, 47500 Bandar Sunway, Malaysia
[2]Microlab, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands; *corresponding author, email: b.savija@tudelft.nl
[3]Department of Building, Faculty of Environmental Design and Management, Obafemi Awolowo University, Ile-Ife 220282, Nigeria

Abstract

Disposal of consumer waste is a major challenge in urban areas around the world. In the field of building materials, it has long been recognized that many types of wastes can be used instead of raw materials. In addition, production of binders such as Portland cement is a CO_2 intensive process. However, for widespread use of wastes in construction, it is important that the properties of resulting building materials are satisfactory. For concrete, the most important are the fresh, hardened and durability properties. A promising waste material that can be utilized to create sustainable concrete composites is waste recycled glass. In this paper, literature dealing with use of waste recycled glass as partial replacement of either cement or aggregate in concrete is systematically reviewed. The focus of this review is the influence of recycled waste glass on the engineering properties of concrete. Main advantages and drawbacks of using recycled waste glass are discussed. The aim of this review is to identify major research needs in the field that will help bring this class of materials closer to worldwide practical use. Given that concrete is the most used man-made material in the world, such development would significantly reduce the need for landfilling of waste recycled glass that is unsuitable for reuse in glass production.

Key words: Waste glass powder, glass powder sand, supplementary cementitious materials, mechanical properties, durability.