20th Academic Sessions 2023
University of Ruhuna
Matara, Sri Lanka
ISSN: 2362-0412

Acid Resistance and Sulphur Resistance of Rubberized Concrete- A Review

D.H.A. Maduranga, J.M.R.S. Appuhamy, W.M.K.R.T.W. Bandara, and T.M. Bandula Heva

Department of Civil and Environmental Engineering, Faculty of Engineering, University of Ruhuna, Sri Lanka.

Abstract

The disposal of used tires is a serious environmental hazard on a global scale, producing problems such as breeding grounds for mosquitoes, sparking uncontrolled fires, and polluting soil and plants. Therefore, it is an urgent requirement to find alternate markets for these tires, with a focus on tire recycling. Recycling tires for use in concrete is now technically viable. However, partially replacing rubber with concrete will substantially affect its mechanical characteristics and durability, and it has produced favourable results when several qualities were considered. Additionally, some of the issues can be resolved by suitably processing the aggregates. So, this article examines the acid resistance and the sulphur resistance of rubberized concrete, which were mostly emphasized based on positive feedback on its durability. Concrete may corrode as a result of acid and sulphate attacks. This involves the entry of acids and sulphates into the concrete, resulting in significant degradation, cracking, expansion, and loss of bonding strength between cement paste and aggregates. Since the products of hydration of alkaline cement react with the hydrogen ions present in the acids, resistance degrades quickly. However, rubberized concrete's chemical performance will increase the concrete's acid resistance. Similarly, some of the previous studies have indicated that adding tire rubber to concrete increases its sulphate resistance. Typically, mass loss is employed as a criterion for assessing the sulphate resistance of the rubberized concrete. The majority of researchers have found that rubberized concrete is more resistant to sulphate attack than conventional concrete. This is mostly owing to the chemically nonreactive nature of rubber concrete. These evaluations are intended to stimulate the use of rubberized concrete in infrastructure development and serve as a foundation for future research on this material mainly in chemically aggressive environments. Therefore, rubberized concrete will result in the sustainable utilization of waste material, safeguarding the environment and conserving sources of dwindling natural aggregates.

Keywords: *Acid Resistance, Durable Properties, Rubberized Concrete, Sulphur Resistance.*

Corresponding Author: *dhamaduranga@gmail.com*