

<https://doi.org/10.7250/CONNECT.2023.111>

SAND PARTIAL AND FULL REPLACEMENT IN CONCRETE COMPOSITE WITH RUBBER CRUMBS

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Abstract – The objective of the research on rubberized concrete that substitutes sand fillers with rubber crumbs by volume or weight is to identify ways to utilize discarded rubber tires and improve the building industry's sustainability. The research indicates that substituting sand fillers with rubber crumbs can have a substantial effect on the concrete's physical and mechanical qualities. Significant decreases in flexural strength and compressive strength are observed when 100 % of the sand is replaced with rubber crumbs, showing that the attributes of rubber concrete are weaker than those of conventional concrete. Note that the precise mix design and proportion of rubber crumb replacement will alter the qualities of rubber concrete. Therefore, it is essential to conduct proper laboratory testing and trial mixing in order to optimize the mix design and determine the replacement % that would deliver the needed qualities and match the standards. The flexural strength of the reference sample was 2.7 MPa and its compressive strength was 57.7 MPa, compared to the compressive strength of the sample in which 100 % of the sand was replaced with rubber crumbs. The flexural strength of sr100 was 0.39 MPa and its compressive strength was 4.4 MPa. It is also important to note that rubberized concrete may still have some advantages over ordinary concrete, such as enhanced sound insulation, thermal insulation, and chloride ion penetration resistance. These characteristics may make it useful for applications including sound barriers, underground constructions, and marine structures.

Keywords – Concrete composite; rubber crumbs; substitutes sand filler; utilize discarded rubber