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Assessment of Flexural and Compressive Strengths in Concrete Utilizing Replacement of Coarse Aggregates with Rubber

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Abstract: *Employing waste rubber as a substitute for natural aggregate in concrete presents a promising environmentally conscious solution. The primary objective of this research is to assess the concrete's performance concerning its compressive and flexural strengths when coarse aggregate is partially replaced with recycled rubber. Seven distinct mixes were formulated, encompassing varying degrees of crumb rubber replacing coarse aggregate: 0%, 5%, 15%, 25%, 50%, 75%, and 100% by volume. The rubberized concrete underwent evaluation based on slump, compressive strength, flexural strength, density, and the influence of slight seawater exposure. Notably, the rubberized concrete blends exhibited enhanced workability and reduced density compared to the control mixture. As the proportion of coarse rubber content increased, there was a noticeable decline in compressive, tensile, and flexural strengths. Impressively, the rubberized concrete formulations displayed commendable performance even after a mere 28-day curing period in seawater conditions. The outcomes of this study provide a comprehensive understanding of the implications of integrating recycled rubber into concrete, particularly for various road construction projects prone to regular slight seawater infiltration. This approach is applicable up to a 25 percent volume replacement of rubber particles, underscoring its feasibility and effectiveness.*

Keywords: rubber, concrete, seawater, flexural, compressive

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