Engineered crumbed rubber concrete for vibroacoustic reduction in railway built environment

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by

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Abstract: Environmental friendly structural concrete using recycled waste tires, rubber and synthetics in structural concrete as either aggregate or filler have faced a number of challenges over the decade. The crumbed rubber concrete (CRC) was initially developed for low-profile non-structural elements such as pedestrian pathway, acoustic wall panel, and furniture due to its low strength. Although it has excellent thermal insulation property, using wasted rubber as aggregate could cause adverse effects on durability, creep and shrinkage, and abrasion resistance. Modern nanotechnology provides an opportunity for CRC modifications to improve strength while maintain high damping and good sound absorption. Experimental results show that silica fume can improve CRC compressive strength, splitting, bending strength, the folding ratio, and the toughness of concrete. Despite the abundant data of CRC research, considerable emphasis has still been placed on its strength and microstructure. In addition, there is a major knowledge gap and practical insight into the modification, utilisation and application of CRC in railway industry. This presentation will highlight the development and feasibility assessments of the engineered concrete through extended collaborative research and experiments for applications in suppressing noises and vibrations in railway built environment.

Keywords: Crumb rubber, Concrete, Vibro-acoustics, Reduction, Railway, Built Environment, Noise reduction material, Dynamic properties, Flexural-mode damping.

Presentation video is available at https://denorms.eu/
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References:


