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EVALUATION OF THE EFFECT OF RAW SUNFLOWER SEED SHELLS ON THE WORKABILITY AND HEAT OF HYDRATION OF CONCRETE

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ABSTRACT

Getting rid of natural wastes by utilizing them in concrete composites is an intelligent way of achieving sustainability. In this paper, we evaluate the effect of adding raw sunflower seed shell (SFS) waste on the workability and heat of hydration of concrete. The workability of concrete was assessed by the slump cone test. For the heat of hydration, four 300x300 mm cuboids of concrete were casted while placed inside 500x500 mm cuboids. While maintaining proper insulation, the heat of hydration was measured for concrete mixes containing 1, 2, and 3% volume fraction of SFS, in comparison to a control specimen. The temperature was measured using type -K thermocouples, and readings were recorded every 20-40 minutes over a period of 100 hours after casting. The results have shown that adding the SFS significantly affects the workability of concrete, as SFS appeared to absorb the mixing water and negatively impacts the workability. Furthermore, the samples with SFS have shown a lower heat of hydration when compared to the control sample. However, no significant differences were observed between the three SFS mixes, where all three mixes demonstrated a similar heat development.

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