

# **Fresh and hardened properties of lightweight self-compacting concrete containing walnut shells as coarse aggregate**

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## **Abstract**

Recently the application of self-compacting concrete (SCC) has emerging in construction structures due to its good abilities to improve durability and decrease bleeding with good bonding with rebar. On the other hand, large amount of aggregates is required for the production of SCC. However; replacing natural aggregate in SCC with waste materials can led to discover ecological building materials. Walnut shell (WS) is one of the agriculture waste materials which can be used as a substitution of aggregate in SCC. In this research, WS was used as a replacement of coarse aggregate for constructing SCC by employing ten different volume fractions from 5% to 50% with each increment of 5%. Fresh and hardened properties of SCC were investigated for all mixes and control one. The results showed that all tested properties decreased by increase WS volume fraction. However; the lightweight self- compacting concrete (LWSCC) can get at fraction volume of WS equal and or more than 35%. Where, slump flow diameter (SFD), compressive and bond strengths were 560 mm, 35 MPa and 6.55 MPa respectively achieved at 35% ratio of WS