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Particle size of Acacia Modesta gum powder changes the properties of self-compacting paste ssytems

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Acacia Modesta gum powder is the novel material which has recently found its uses in cementitious systems. Particle size of powdered Acacia Modesta (AM) gum affects the fresh and hardened properties of self-compacting paste (SCP) systems and this aspect has not been researched so far. This paper focuses on the effect of particle size of botanical Acacia Modesta (AM) gum powder incorporated in self-compacting paste systems (SCPs). Powdered Acacia Modesta gum with an average particle size (D50) of 307 microns, 135 microns and 47.5 microns were used with variable Acacia Modesta (AM) gum dosages in the range of 0.25% to 1% by weight of the dry cement. The result showed that with the decrease in the average particle size of AM gum powder, the water demand, viscosity, yield stress, Vicat setting times, water absorption capacity, air content and maximum shrinkage values of SCPs were reduced while super-plasticizer (SP) demand, compressive strength, fresh and harden cement paste densities got increased.

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