

# **COMBINATION OF GUAR GUM DERIVATIVES AND SUPERPLASTICIZERS, IMPACT ON PROPERTIES OF PORTLAND CEMENT-PASTES**

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Chemical admixtures allow to modify the properties of fresh or hardened cementitious materials. In the case of self-compacting concrete, superplasticizers are introduced with the aim to decrease the yield stress and the viscosity of the materials. However, for preventing segregation and bleeding, and improving the water retention of cement-based system, stabilizing agents or viscosity agents are often introduced in addition. Among these admixtures, polysaccharides are most commonly used.

The study focused on competitive or synergetic effects induced by the combination of stabilizing agents based on hydroxypropyl guar (HPG) and superplasticizers on properties of cement pastes. Two polycarboxylate superplasticizers (PCE) exhibiting different charge densities and three different HPGs were studied. The combination of HPG with PCE superplasticizer strongly modifies the rheological behavior of cement pastes. Despite the presence of HPG, the viscosity of the pastes strongly decreased with increasing dosage of PCE. The viscosity was even close to the viscosity of a cement paste with PCE only. However, the use of HPG in combination with PCE allows maintaining a significant yield stress compared to PCE alone. The charge density of the PCE seemed to affect the drop of the viscosity and the gain on the yield stress induced by HPG.

The results also highlight a delay in the setting-times of the cement paste by adding HPG and PCE. The delay induced by HPGs is significantly lower than that generated by PCEs. However, the combination of the both kind of admixtures lead to a slightly shorter setting compared to the PCE alone.