

Influence of Silica Fume on Ultrahigh Performance Concrete

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Abstract : Silica fume, also known as microsilica (MS) or condensed silica fume is a by-product of the production of silicon metal or ferrosilicon alloys. Silica fume is one of the most effective pozzolanic additives which could be used for ultrahigh performance and other types of concrete. Despite the fact, however is not entirely clear, which amount of silica fume is most optimal for UHPC. Main objective of this experiment was to find optimal amount of silica fume for UHPC with and without thermal treatment, when different amount of quartz powder is substituted by silica fume. In this work were investigated four different composition of UHPC with different amount of silica fume. Silica fume were added 0, 10, 15 and 20% of cement (by weight) to UHPC mixture. Optimal amount of silica fume was determined by slump, viscosity, qualitative and quantitative XRD analysis and compression strength tests methods.

Keywords : compressive strength, silica fume, ultrahigh performance concrete, XRD

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