

Experimental Characterization of Flowable Cement Pastes Made with Marble Waste

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Abstract : The development of self-compacting concrete (SCC) marks a huge step towards improved efficiency and working conditions on construction sites and in the precast industry. SCC flows easily into more complex shapes and through reinforcement bars, reduces the manpower required for the placement; no vibration is required to ensure correct compaction of concrete. This concrete contains a high volume of binder which is controlled by their rheological behavior. The paste consists of binders (Portland cement with or without supplementary cementitious materials), water, chemical admixtures and fillers. In this study, two series of tests were performed on self-compacting cement pastes made with marble waste additions as the mineral addition. The first series of this investigation was to determine the flow time of paste using Marsh cone, the second series was to determine the rheological parameters of the same paste namely yield stress and plastic viscosity using the rheometer Haake RheoStress 1. The results of this investigation allowed us to study the evolution of the yield stress, viscosity and the flow time Marsh cone paste as a function of the composition of the paste. A correlation between the results obtained on the flow test Marsh cone and those of the plastic viscosity on the mottled different cement pastes is proposed.

Keywords : adjuvant, rheological parameter, self-compacting cement pastes, waste marble

Conference Title : ICCGE 2015 : International Conference on Civil and Geological Engineering

Conference Location : Chicago, United States

Conference Dates : October 08-09, 2015