

Drying of Cementitious Materials: A Comparison Between Plain Mixtures and Mixtures Containing Shrinkage-Reducing-Admixtures

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Abstract

Shrinkage Reducing Admixtures (SRAs) are increasingly being used in concrete as a method to minimize shrinkage and shrinkage cracking. SRAs reduce shrinkage by decreasing the surface tension of the pore solution; however the SRA also impacts the viscosity, water activity, and density. Consequently, the absorption and desorption process of cementitious systems containing SRA is altered. This presentation will describe experimental measurement of drying in plain cementitious mortars and cementitious mortar samples containing SRAs. The research will be divided into three components. First, the properties of the solution (surface tension, viscosity, and activity) are measured at different temperatures. Second, the non-linear moisture diffusion coefficient is quantified at different relative humidities (degrees of saturation). Third, the moisture profile in concrete slabs is evaluated after lengthy drying periods. The results will be discussed in terms of theoretical observations in an effort to place the modeling of moisture and shrinkage gradients in concrete on a more fundamental footing.