

Effect of Shrinkage-reducing Admixture on Volume Stability of Cement-based Materials at Early Ages

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Initial time of cracking in mortar under drying restrained shrinkage and electrical resistivity of cement pastes with variant dosage of shrinkage-reducing admixtures (SRA) were tested using a five-group crack apparatus and a non contact resistivity meter, respectively. Free shrinkage-swelling and strength under different cured conditions of corresponding mortars are performed. The results show that the addition of SRA leads to less drying and self-shrinkage but more mass loss of mortar. And the SRA cement paste has a slower hydration at early ages and a lower development of microstructures and strength. Consequently, the SRA mortar cured in drying conditions shows a lower stress development and a later initial cracking time. However, the SRA mortar cured in water shows a higher shrinkage at earlier ages and the SRA paste shows a higher temperature-rise during the hydration period. So, SRA may not be able to control thermal cracking in mass concrete.