Effectiveness of Surface or Bulk Hydrophobic Treatments in Cementitious Materials

F. Tittarelli, G. Moriconi
Università Politecnica delle Marche, Ancona, Italy

Water is the main agent for every deterioration process of cementitious materials, therefore surface hydrophobic treatments or the introduction of hydrophobic agents directly in the mixture should involve an increase in durability.
In this work, the effectiveness of surface or bulk hydrophobic treatments at different dosages was compared in mortar and concrete specimens, even in presence of cracks. Compressive strength was also determined by detecting strength loss for increasing dosage of the hydrophobic admixture.
High dosage (1% by cement weight) causes significant compressive strength loss (20%), but it is able to reduce the water absorption by about 80%, reaching hydrophobic efficiency comparable with surface hydrophobic treatments. In any case, a 0.5% dosage is able to guarantee optimal efficiency, giving satisfactory compromise between mechanical strength loss and water absorption gain. Moreover, the effectiveness of bulk hydrophobic treatments is always much more durable than that of surface hydrophobic ones.