

History and Overview of Self Compacting Grout and Concrete: Properties and Applications

Hakim S. Abdelgader Full Professor, University of Tripoli, Faculty of Engineering, Civil Eng. Dept.,
Tripoli, Libya. hakimsa@poczta.onet.pl

Two-stage concrete (TSC) is a simple concept; it is made using the same basic constituents as traditional concrete: cement, coarse aggregate, sand and water as well as mineral and chemical admixtures. The main benefits of the method are widely appreciated as Low heats of hydration, high compressive strengths and density, economic savings, practically no mass shrinkage, low coefficient of thermal expansion, excellent bond to existing structures. As the name would suggest it is produced through a two-stage process. Firstly, washed coarse aggregate is placed into the formwork in-situ. Later a specifically designed grout is introduced into the form from the lowest point under gravity pressure to fill the voids, cementing the aggregate into a monolith. TSC is particularly useful for underwater construction, placement in areas with closely spaced reinforcement and in cavities where overhead contact is necessary, repairs to concrete and masonry where the replacement is to participate in stress distribution, heavyweight (high-density) concrete, high-lift monolithic sections, and in general, where concrete of low volume change is required. This paper presents some implementations of using such concrete in repair works, some formulae and guide lines which describe the mechanical parameters of this concrete such as modulus of elasticity, tensile strength and drying shrinkage. Keywords: Modulus of elasticity, Compressive-strength, Tensile strength, Aggregate, drying shrinkage.