Annex 15

Developing an Indian Standard for Determining the Flow Behaviour of Superplasticized Cement Paste Using the Mini-slump Test.

The properties of high-performance concrete, mainly in the fresh state are governed by the flow behaviour of the paste phase, which is controlled by the dispersion of cement particles by the superplasticizer. The mini-slump test developed by Kantro [1980] has been used to study the flow behaviour of superplasticized cement paste. The selection of the type and dosage of superplasticizer can be based on the relative fluidity of cement paste through mini-slump test (Aı¨tcin, 1998; Agullo et al., 1999; Jayasree and Gettu, 2008; Jayasree and Gettu, 2010; Jayasree et al., 2011; Jayasree and Gettu, 2012; John and Gettu, 2014). In this test, a mould in the shape of a truncated cone is filled with cement paste, and the spread diameter is measured after lifting the mould. The dosage corresponding to a constant spread is taken as the maximum dosage of the superplasticizer. Furthermore, this test is especially important in determining the dosage of the superplasticizer for mixes containing supplementary cementitious materials, 3D printing and ultra high performance concrete. Even though this simple test method is widely used for research and practical proposes, a standard is lacking for the mini-slump test.

The development of an IS code for the mini-slump test method provides a standard procedure, considering the local material characteristics, leading to more relevant results suitable to Indian construction industry. It will ensure workability and stability, leading to optimized use of the superplasticizer, other raw materials and reducing the wastage of the material. In addition to its use in the field, the test will be suitable for cement companies as well as chemical admixture companies for developing compatible cement-superplasticizer combinations. The standardization of this test method will help in better quality control and compliance with the regulatory standards. Developing this specific Indian standard for understanding the flow behaviour of superplasticized cement paste according to national requirements will promote innovation and further research tailored to India's specific requirements in the construction field.

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