

Changing Properties of Self-Compacting Concrete with Different Proportions of Fly Ash

Mohammad Kamran¹, Mudit Mishra²

¹*Department of Civil Engineering, Jamia Millia Islamia, Jamia Nagar, New Delhi*

²*Department of Civil Engineering, Manav Rachna International University, Delhi
Surajkund Road, Aravalli Hills, Faridabad, Haryana, India*

ABSTRACT

Self compacting concrete has been playing vital role in the mass concreting nowadays especially in the structures where reinforcement used is very dense and in narrow tubular sections. This paper talks about its variation in properties on different proportions of fly ash in the mix which were taken as 15%, 25%, and 35% in place of cement. For one proportion, a set of 6 cubes was casted and the same was to be tested at 7 days and 28 days for strength. The temperature of sample cubes was kept constant at 24°C for the whole period. The mix design was done for M25 grade. The W/C ratio was kept constant at 0.45. The proportion of fine aggregates to coarse aggregates was kept at 70:30 and maximum size of aggregates was 20 mm. Total powder content was kept at 530 Kg/m³. The quantity of super plasticizer was kept at 450 ml for the samples which was 1% of the total volume. The properties were checked by conducting slump test, J-Ring Test, L-Box Test, V-funnel Test, and U-Box Test with compressive strength test after 7 days and 28 days. The slump value was maximum for 35% replacement of cement with fly ash and lowest for 25% replacement. V-funnel value was lowest for 35% replacement. J-ring was lowest for 15% replacement. U-box value was maximum for 25% replacement. L-box value was highest for 35% replacement. The most important compressive strength test showed very surprising results. Only 15% replacement samples showed characteristic strength after 7 and 28 days. 25 % replacement samples gained only 55% of desired strength and 35% replacement samples gained only 33% of desired strength after 7 days and gained 92% and 80% of desired strength after 28 days respectively.

Keywords: Self Compacting Concrete, Fly Ash, V-Funnel, Slump Value, Compressive Strength
