

Mixing Time: Influence on the Compressive Strength

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Abstract : A suitable mixing time of the concrete, allows form a homogeneous mass, quality that leads to greater compressive strength and durability. Although there are recommendations as ASTM C94 standard these mention the time and the number of minimum and maximum speed for a ready-mix concrete of good quality, the specific behavior that would have a concrete mixed on site to variability of the mixing time is unknown. In this study was evaluated the behavior a design of mixture structural of $f'c=250$ kg/cm², elaborate on site with limestone aggregate in warm sub-humid climate, subjected to different mixing times. Based on the recommendation for ready-mixed concrete ASTM C94, different times were set at 70, 90, 100, 110, 120, 140 total revolutions. A field study in which 14 works were observed where structural concrete made on site was used, allowed to set at 24 the number of revolutions to the reference mixture. For the production of concrete was used a hand feed concrete mixer with drum speed 28 RPM, the ratio w/c was 0.36 corrected, with a slump of 5-6 cm, for all mixtures. The compressive strength tests were performed at 3, 7, 14, and 28 days. The most outstanding results show increases in resistance in the mixtures of 24 to 70 revolutions between 8 and 17 percent and 70 to 90 revolutions of 3 to 8 percent. Increasing the number of revolutions at 110, 120 and 140, there was a reduction of the compressive strength of 0.5 to 8 percent. Regarding mixtures consistencies, they had a slump of 5 cm to 24, 70 and 90 rpm and less than 5 cm from 100 revolutions. Clearly, those made with more than 100 revolutions mixtures not only decrease the compressive strength but also the workability.

Keywords : compressive strength, concrete, mixing time, workability

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