Influence of Magnetized Water on the Split Tensile Strength of Concrete

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Abstract : Concrete has high compressive strength but a low-tension strength. The small tensile strength of concrete is regarded as its primary weakness, which is why it is typically reinforced with steel, a material that is resistant to tension. Even with steel, however, cracking can occur. In strengthening concrete, only a few researchers have modified the water to be used in a concrete mix. This study aims to compare the split tensile strength of normal structural concrete to concrete prepared with magnetic water and a quick setting admixture. In this context, magnetic water is defined as tap water that has undergone a magnetic process to become magnetized water. To test the hypothesis that magnetized concrete leads to higher split tensile strength, twenty concrete specimens were made. There were five groups, each with five samples, that were differentiated by the number of cycles (0, 50, 100, and 150). The data from the Universal Testing Machine's split tensile strength were then analyzed using various statistical models and tests to determine the significant effect of magnetized water. The result showed a moderate (+0.579) but still significant degree of correlation. The researchers also discovered that using magnetic water for 50 cycles did not result in a significant increase in the concrete's split tensile strength, which influenced the analysis of variance. These results suggest that a concrete mix containing magnetic water and a quick-setting admixture alters the typical split tensile strength of normal concrete. Magnetic water has a significant impact on concrete tensile strength. The hardness property of magnetic water influenced the split tensile strength of concrete. In addition, a higher number of cycles results in a strong water magnetism. The laboratory test results show that a higher cycle translates to a higher tensile strength.

Keywords : hardness property, magnetic water, quick-setting admixture, split tensile strength, universal testing machine
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