TIDC Transportation Infrastructure Durability Center AT THE UNIVERSITY OF MAINE

Shrinking Chitosan Fibers to Improve Long Term Concrete Durability

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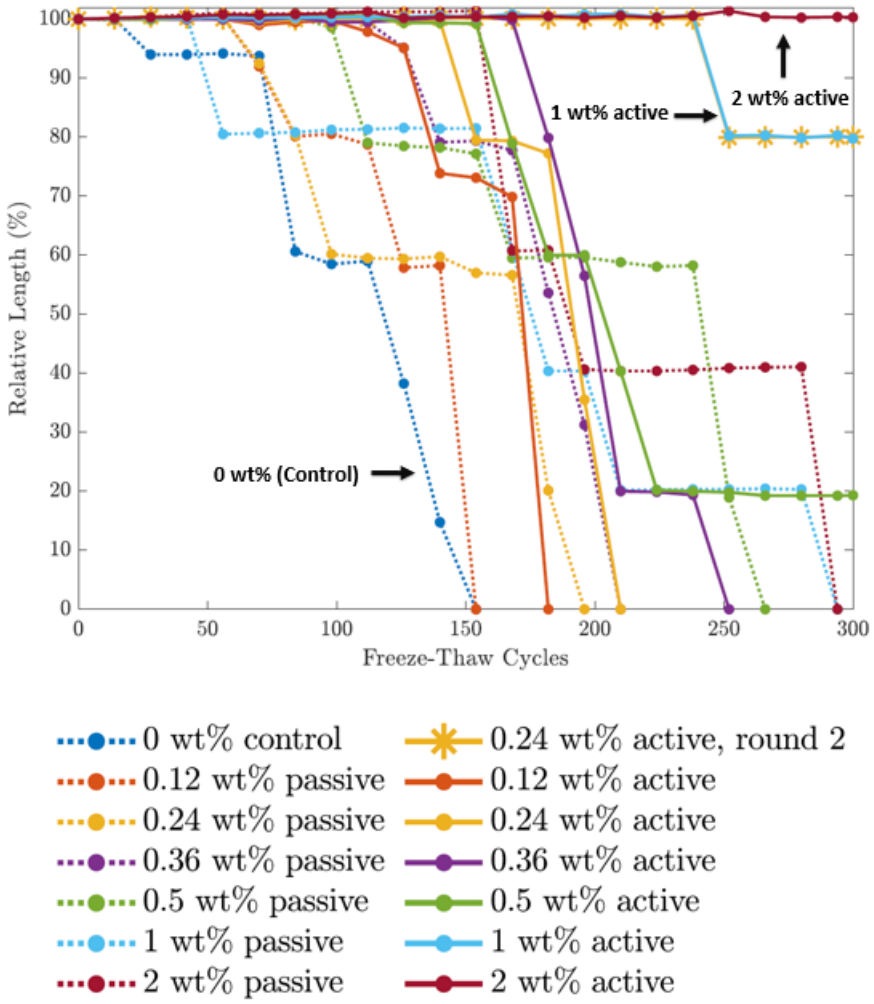
Abstract

Concrete is one of the most widely used materials in the world. However, there are still many improvements that can be made to increase the efficiency of concrete. For example, concrete is weak in tension, and concrete is not durable, added to all this is the fact that concrete has negative environmental impacts. This leaves room for creative research to solve these problems. In this study, we will use chitosan fiber, which shrinks when placed in a high pH medium. Concrete is considered a high pH medium and thus helps shrink the fiber, which leads to the shrinkage of the concrete, thus increasing the concrete durability and strength. Previously, researchers have shown that chitosan fiber increases the durability of concrete. For example, the previous study showed that the concrete group contained 1% chitosan increased the durability factor by 540.5% compared to the control group. Likewise, the previous study showed that the control group was the fastest to fail. Compared to concrete groups that contained chitosan fiber, the effect of chitosan fiber on the compressive and tensile strength of concrete has not been studied. In this study, we study the size and age of the chitosan fiber on the compressive and tensile strength of concrete by comparing concrete that contains chitosan fiber of different sizes and ages to the control group, to study the effect of the size of the chitosan fiber on the concrete compressive and tensile strength. In the previous study, two types of chitosan fiber were studied, namely active and passive chitosan groups, the difference between the two types is that passive fibers were created by preshrinking active chitosan fibers in an alkaline solution, the study showed that active group results are better than the passive group, in this study only active chitosan group will be used.



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References

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