

THE EFFECT OF ADDITION OF MASTERLIFE SF-100 AS A SUBSTITUTION MATERIAL ON THE COMPRESSIVE STRENGTH OF K500 GRADE CONCRETE

Student Name : M. Husni Alfikri
Student ID : 4103221445
Advisor : Alamsyah, M.Eng

ABSTRACT

High-quality concrete such as K500 concrete faces challenges in maintaining its compressive strength and density, especially under extreme environmental conditions. The problem in this study was the suboptimal compressive strength of concrete without the addition of appropriate additives. The proposed solution is the addition of MasterLife SF-100, a silica fume-based material, at 10% of the cement weight to improve concrete performance. This study used a laboratory experiment with 15x15x15 cm cube specimens immersed in freshwater and seawater for 7 and 28 days. Tests were conducted on compressive strength and Ultrasonic Pulse Velocity (UPV) to assess concrete density. The results showed that the addition of MasterLife SF-100 significantly increased the compressive strength and density of concrete compared to standard concrete. The combination with a Polycarboxylate Superplasticizer also improved the workability of the concrete mixture. In conclusion, the use of MasterLife SF-100 effectively improves the performance of K500 concrete and is suitable for use in high-scale construction and extreme environments.

Keywords : K500 concrete, MasterLife SF-100, compressive strength, silica fume, Superplasticizer