

4



# CORRELATION BETWEEN SURFACE ABSORPTION AND CHLORIDE ION PENETRATION OF CONCRETE WITH NANO SILICA AND ITS CORROSION RESISTANCE

Journal: *JOURNAL OF ENVIRONMENTAL PROTECTION AND ECOLOGY* 20(3) (2019) Pages: 1158 - 1171

## ▼ Authors

V ; R. hiyan ; EB Perumal Pillai ; S. Lingeswari

## ▼ Abstract

Water absorption and its transportation through the concrete greatly affect its durability. A concrete with less permeability makes it durable. Nano silica (NS) when added to concrete can act as a filler material and also participate in pozzolanic reaction to improve the density as well as the strength of concrete. In this investigation, concrete samples were made by adding NS (0.5, 1, 1.5 and 2 wt.(\%) of cement) to concrete. The compressive strength increased with increase in NS content up to 1.5(\%). Ultrasonic pulse velocity test showed improvement in concrete density with increase in NS content. Sorptivity test proved the reduction in surface absorption with increase in NS. Reduced chloride ion penetration was also noted during Rapid chloride penetration test (RCPT). A relationship between water absorption and current passed was found, and using this relationship a prediction chart was proposed. The impressed current technique with constant voltage and varying current was used to study the corrosion resistance property of concrete. The denser concrete with NS showed better resistance to corrosion than concrete without NS. When NS was used the concrete became stronger, less permeable and corrosion resistant.

## ▼ Keywords

nano silica; RCPT; sorptivity; Ultrasonic pulse velocity (UPV); accelerated corrosion; surface absorption; impressed current technique; COMPRESSIVE STRENGTH; IMPRESSED CURRENT; NANOPARTICLES; PERMEABILITY; WORKABILITY; NANOSILICA; MORTAR; DAMAGE; SLAG

## ▼ Cite this article

V; R. hiyan; EB Perumal Pillai et al. (2019), CORRELATION BETWEEN SURFACE ABSORPTION AND CHLORIDE ION PENETRATION OF CONCRETE WITH NANO SILICA AND ITS CORROSION RESISTANCE, *JOURNAL OF ENVIRONMENTAL PROTECTION AND ECOLOGY*, 20(3), 1158-1171.

This article's full text requires paid access.

[Request paid subscription from your Profile](#)

Copyright © SciBulCom Ltd. 2023

