

Methods of improving the concrete durability in buildings

[Life](#), [Home](#)



The concrete is a low-cost, pollution free and often used to create walls for houses against bad weather conditions. However, the problem is when a crack appears and tends to progress further without proper maintenance. If these cracks expand and reach the steel reinforcement, not only the concrete will be attacked, but also the reinforcement will corroded as it will be exposed to water, oxygen, possible carbon dioxide and chlorides that will reduce the metals durability and might cause more problems for houses made with concrete. This eventually will lead to a higher repair cost.

Recent investigations was performed on improving the durability of concrete walls by adding silica fume granules mixed with solid super plasticizer resulting a decrease in permeability (Karein et. al, 2017). In a recent study, silica fume and alccofine was utilize as supplementary cementitious materials for self compacting concrete creating tremendous effect for both mechanical and durability (Mohan and Mini, 2018). Similarly, the synergistic effect of silica fume and pumice concluding a similar effect for concrete (Madani et. al, 2018). In contrast, a comparative study was performed between metakaolin and silica fume mixed on a concrete revealing that the durability with metakaolin is better (Hassan et. al, 2012). The transport properties through the silica fume concrete medium are reduce like liquid, resulting a low permeability.

The mussel shells are waste materials tend to be only thrown out or decorate an object, but these shells contain silica. Mussel shells remained durable underwater because of its silica having an excellent temperature resistance. An investigation was performed to utilize mussel shells as replacement for

the natural gravel in the concrete mix resulting of a good workability (Foti and Cavallo, 2018). The type of mussel shell used comes from Italian shellfish farming, which generates 100, 000 tons per year of mussel shell waste, and with the usage of the shells it will result to reduction of waste in the environment.

However, the process of reapplying cement will be time-restraining for existing homes and it will be expensive depending on the size of the house. On the other hand, people could utilize wall paint to apply a silica coating for cement walls that could have a similar effect in terms of resistances against rainfall process such as repainting instead of applying new layer of cement will save time and truly less expensive. In fact, the waste material containing silica like mussel shells can be use as an additive to wall paint for developing a waterproof coating for cement walls.

Information from the research highlights the effects of utilization of mussel shell as an additive to develop a waterproof coating for cement walls. The availability of a waste material mussel shells will be clean using different abrasives, then will be boil in water for 15 minutes and finally will dry in order to ensure to eliminate all the organic parts (Foti and Cavallo, 2018). After that the shells will be crush turning it into a powdered substance and then it will be mixed to a wall paint to acquire its silica properties. The wall paint will be applied on a concrete block to test the result on its resistance against rainfall. It will be monitor to investigate if it will attain a similar effect to a concrete mix. Comparison shall be done between a wall paint mixed

with silica and regular wall paint to check if it will acquire any difference when silica is mixed in.

This study finds importance on developing a new method to improve the cement walls durability that is simpler than the longer method while attaining the similar effects in both. It will sustain the durability of the walls and the steel reinforcement inside it will remain undamaged also it will be more prepared to handle disasters lastly it will also avoid an expensive repair cost. The walls are very important on a house as it supports roofs, floors and ceilings, and to provide shelter and security for the house. After all, home should be the safest place for a person to settle in.