

SELF-HEALING CONCRETE- A NOVEL APPROACH FOR CIVIL ENGINEERING

JAGMEET SINGH, JASPAL SINGH & MANPREET KAUR

Department of Civil Engineering, Punjab Agricultural University, Punjab, India

ABSTRACT

Concrete structures often suffer from cracking that leads to much earlier deterioration than designed service life. Repairs can be particularly time consuming and expensive because it is often very difficult to gain access to the structure to make repairs, especially if they are underground. In particular, the utilization of self-healing technologies has high potential as a new repair method for cracked concrete. Self-healing is a natural process of crack repair that can occur in concrete in the presence of moisture. Self-healing character of concrete can be accelerating using different materials like mineral admixture, bacteria and fibers. Mineral admixtures have been deployed as an approach for self-healing of concrete cracks by reducing the water permeability after concrete damage. Mineral admixture (Expansive agents and geo-materials) swell in the presence of water and fills the cracks. Fibers in concrete recover the mechanical properties of concrete as a result of self-healing of concrete and helps to controlled tight crack width. Bacteria additive self-healing approach utilizes bacteria that induce precipitation of calcium carbonate as a result of carbonate generation by bacteria metabolism in a high calcium environment. The precipitation of calcium carbonate fills the larger cracks. Self-healing concrete has significant implications in extending service life of building by reducing its repairing and repairing costs. Thus, self-healing concrete could be a major enabling technology towards sustainable civil infrastructure.

KEYWORDS: Bacteria, Concrete, Fibers, Mineral Admixture, Self-Healing