Maximizing the self-healing capacity in asphalt pavement

Asphalt concrete has the potential to heal the damage itself, but its healing rate is not sufficient at ambient temperatures (especially at low temperatures).

It is also not wise to stop the traffic circulation on the road to allow full healing. Thus, increasing the self-healing rate of asphalt concrete in road engineering is a challenging task.

Inclusion of self-healing technology in asphalt pavement is proving to be a suitable method to increase the service life of an asphalt pavement. With the objective of increasing the self-healing capacity in asphalt, two extrinsic healing methods have been investigated: induction healing and embedded capsule healing. Induction heating has been proved to be an effective method for asphalt crack healing, but the increasing of temperature also accelerates the ageing of the asphalt binder. However, this negative effect can be improved by combining the capsule healing.

The concept of capsule healing is to deliver healing agent (rejuvenator) to the damage site and rejuvenate the aged binder to repair the damage.

The main goal of this project is to achieve a better healing in asphalt concrete by combining the advantages of induction-healing and microcapsule-healing, thus avoiding the negative effects of each of the two solutions. When cracks happens, induction heating can be used to heal them. At the same time, the rejuvenator from microcapsules can reach every part of the asphalt concrete and recover the original stiffness of the aged asphalt •