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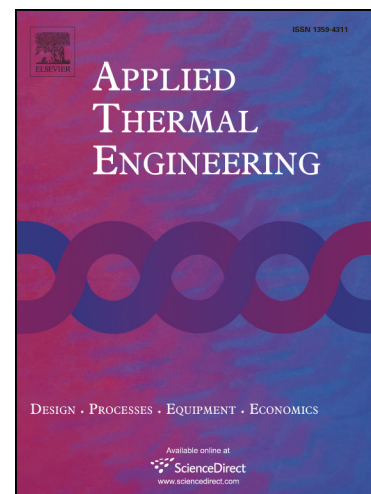
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Snow and Ice Melting Properties of Self-healing Asphalt Mixtures with Induction Heating and Microwave Heating

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Abstract

In this paper, the snow and ice melting properties of self-healing asphalt mixtures with induction heating and microwave heating were investigated. The self-healing performance of the mixtures during ice melting process was measured with cyclic three-point bending test as well. The results indicated that the snow and ice melting performance of self-healing asphalt mixtures with appropriate heating techniques was remarkable. The average melting velocity of ice melting was improved from less than 1g/min (previous researches) to more than 10g/min, while the average snow melting velocity of steel fiber modified asphalt mixture and steel slag asphalt mixture with microwave heating could reach 53.9g/min and 48.5g/min respectively. The water from melted ice/snow played a major role in the melting process of snow with microwave heating. However, the moisture from melted ice/snow on the surfaces of crack prevented the thermal healing of asphalt mixtures. It is recommended that another heating process after the melting process should be applied to promote the healing of cracks as well as to prevent the melted snow and ice water on the pavement from freezing.

Key words: self-healing; asphalt mixtures; snow and ice melting; induction heating; microwave heating; energy efficiency.

1 Introduction

As is known, snowfall, sleet, and freezing rain were big problems for road traffic safety in cold regions

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