

Effect of Blending Temperature and Blending Duration on the Degree of Blending of Reclaimed Asphalt Binders

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Abstract

Recycled asphalt mixtures are getting more popular due to many economic and environmental benefits such as a higher degree of recyclability, low material cost, less effect on the environment etc. Typically, reclaimed asphalt pavement (RAP) materials are combined with virgin aggregates and virgin asphalt binder to produce recycled asphalt mixtures. The amount of RAP binder mobilizes into the mixture is called the degree of blending. The degree of blending of reclaimed asphalt pavement (RAP) binder is strongly influencing the performance of recycled asphalt mixtures. If the degree of blending is known, the asphalt mix designers can make better decisions during the mix design process to produce more durable recycled asphalt mixtures. If the degree of blending is overestimated, the mixture could have less amount of binder. On the other hand, underestimating the degree of blending could produce mixtures with higher binder content. Hence, it is very important to properly determine the degree of blending of RAP binder. However, understanding the factors affecting the degree of blending and quantifying the degree of blending is still an open problem for researchers. This study investigates the effect of several factors such as blending method, blending temperature, blending duration, and RAP content on the degree of blending using Fourier Transform Infrared Spectroscopy (FTIR) analysis of the extracted binder from mixtures. It is revealed that the blending method, blending temperature, and blending duration have a significant influence on the degree of blending. The study revealed that prolonged blending durations and elevated mixing temperatures could improve the degree of blending. The amount of RAP in the mixture has little or no influence on the degree of blending. Further, based on the results, a blending chart is developed to determine the degree of blending with regard to blending duration and blending temperature.

Keywords: *Degree of blending, RAP, FTIR, Blending chart, Fluorescence microscopy, SBS modified asphalt*

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