

# Recycled Asphalt Mixture Optimum Rejuvenation and Relation to Marshall Mix Design Properties

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The application of rejuvenator as a recycled asphalt properties restaurateur, has increased the possibility of using high Recycle Asphalt Pavement (RAP) percentage mixtures in the new pavement construction projects. If petroleum-based rejuvenator was the first alternative for modifying the aged binder, the trend is now to the vegetable-derived oil recycled from the food industry. It allows for restoring the pavement property and is very economical. However, determining the optimum quantity of rejuvenating agent for a certain amount of RAP remain a challenge, because of the singularity of the aged binder. The mean for determining the dose can be different according to the approach we choose. We evaluated in this study two methods of determining the optimum rejuvenating agent, that is Soybean recycled waste cooking Oil (SBO). The first method was penetration based and the second method was Kinematic viscosity based. Result showed different trend and rejuvenation rate as a function of the method used. optimum contents were found to be 7.65% and 12.56% for Penetration based and Viscosity based respectively. A mix design determining the impact of such contents at constant mixture binder content were performed using Marshall mix design method. It was denoted surprisingly almost similar behavior, but slightly different optimum binder content, 5% and 5.26% for Penetration based and viscosity based method respectively. Further research on the effect of the SBO on the performances related properties of asphalt mixtures will confirm the possibility of using it as an alternative rejuvenator.

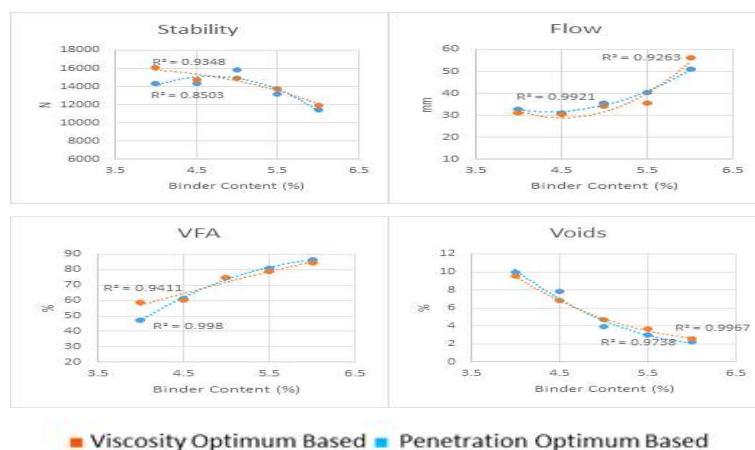


Figure 1: Marshal Volumetric properties as a function of Rejuvenator content.

**Keywords :** Soybean, Rejuvenator, RAP, Penetration, Kinematic viscosity, optimum rejuvenator content

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