

Evaluation of Temperature Susceptibility Measures in Penetration Grade Bitumen Used In Sri Lanka

J.N.Meegahage¹ and W.K.Mampearachchi²

In the recent years Sri Lanka has experienced a massive evocation in highway construction than any other period in the history. This leads to enhance the quality of ride and minimize the cost and time incur with transportation industry. Most of these highways are being constructed with Hot Mix Asphalt (HMA) where bitumen is a major constitution. The increase in demand for bitumen has lead the way to increase bitumen production and import significant amount of bitumen. In order to have good quality long lasting pavements one should ensure the usage of bitumen with desired properties. In Sri Lanka 60/70 penetration grade bitumen is used for HMA. One of the major problems in penetration grade bitumen is the absence of temperature susceptibility measures within the grading system. In this study the bitumen used in Sri Lankan roads are evaluated using several temperature susceptibility measures. They are Penetration Index (PI), Viscosity Temperature Susceptibility (VTS) and Pen-Vis Number (PVN). Bitumen samples collected from various highway projects around the country was evaluated using the above temperature susceptibility measures. The result of these measures has been analyzed for the correlation and with the limits specified in literature. It was found that there no good correlation between penetration and softening point of bitumen samples. About 50% of the samples tested showed lower penetration than the required penetration and similar behavior was obtained with their consistency. Penetration Index related to softening point showed that many samples tested were in highly temperature susceptibility region. VTS values for the test samples were scattered throughout and out of the VTS limits. PVN values obtained for the test samples were scattered closely at the temperature susceptibility region. Using the findings of the literature the behavior of PVN was approximated to PI which shows further evidence of temperature susceptibility nature of Sri Lankan bitumen. The results of temperature susceptibility measures of PI, PVN and VTS highly vary among the samples.

Key words: Bitumen, Temperature susceptibility, Penetration grading

Authors Details:

1. Research Assistant, Department of Civil Engineering, University of Moratuwa, mjeewana@gmail.com
2. Senior Lecturer, Department of Civil Engineering, University of Moratuwa, wasanthak@civil.mrt.ac.lk