

## LINEAR VISCOELASTIC PROPERTIES OF BLENDED ASPHALT

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### *ABSTRACT*

One of the most critical tasks for a pavement engineer is to predict the rheological behavior of asphalt binder over a wide range of temperature. The fact that the behavior of asphalt also changes with the crude source, processing method and aging condition makes this task difficult. This study focuses on selecting a suitable rate type model to predict the mechanical response of the binder in 20 to 50 °C temperature regime. Four types of rate type models were used and they are Maxwell, Voigt-Kelvin, Jeffreys and Burgers'.

Blended asphalt from Arab mix crude source was tested in oscillatory shear mode for unaged and long term aged conditions. A dynamic shear rheometer was used and the testing consisted of conducting a frequency sweep from 20 Hz to 0.001 Hz at 5 °C increment from 20 to 50 °C. It was seen that the suitability of the model to predict the mechanical response was largely dependent on the temperature of testing. The Burgers' model predicted the mechanical response much better in the 20 to 50 °C temperature regime. Also, the sol-gel transition obtained from Burgers' model parameter was near  $G'-G''$  cross-over temperature.

**KEY WORDS:** Frequency sweep, blended asphalt, aging, Burgers' model, Sol-gel transition.