CONVENTIONAL VERSUS SUPERPAVE ASPHALT BINDER CHARACTERIZATION

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ABSTRACT
Grading or characterization of asphalt binder goes back to 1888, when H. C. Bowen invented the Bowen Penetration Machine. Later viscosity and softening point tests were introduced to measure the consistency of asphalt at intermediate to high temperatures. Rotational viscometer (RV) characterizes the behavior that simulates mixing and laydown operations. Later SUPERPAVE™ binder specifications as a result of Strategic Highway Research Program (SHRP) recommended the use of Dynamic Shear Rheometer (DSR).

In order to compare the results from different modes of testing, data was converted in units of viscosity by making use of available correlations. In addition to the viscosity comparison, VTS suggested under ASTM D-2493 was utilized to compare over a broad range of temperatures.

A significant difference was observed between the conventional testing and the DSR test results. The difference is a function of binder grade; stiffer binders resulted into greater difference and vice versa. In addition, testing shear rate is a dominant factor for this difference. Conventional testing is carried out at relatively low shear rate compared to DSR testing. A reasonably accurate shift factor for the neat asphalt was developed to establish differences between the conventional and DSR testing.

KEY WORDS: Conventional, Superpave, Steady state, Shear rate, Viscometer