Rheological Assessment of Neat Paving, Air Rectified Paving & Oxidized Roofing Bitumen

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1. Introduction

Rheology of neat paving, air rectified roofing bitumens studied to understand chemical changes during oxidation. Mastercurve analysis and traditional bitumen tests utilized to distinguish air-rectified and oxidized grades.

2. Objective

Use rheology to differentiate between air rectified and oxidized bitumen.

3. Methods

• Straight-run bitumen samples (PAVE – 80/100A, RAF – 300/400A) air-blown at 200, 230, and 260°C to produce air rectified and oxidized products.
• Isothermal frequency sweeps performed at −10 to 150°C. Mastercurves of dynamic material functions constructed.
• ASTM and AASHTO specification parameters determined.

4. Conclusions

• Minor differences in rheology of neat and air rectified paving bitumens confirm that air rectification does not significantly alter bitumen composition.
• Corrected creep compliance differentiates air rectified paving and oxidized roofing grades.
• Absence of equilibrium compliance in oxidized roofing bitumen revealed significant compositional changes.
• Bitumen empirical tests supported rheology results.
• PVN vs. PI clearly differentiates air-rectified paving and oxidized roofing grades.

[Graphs and tables]

Presented at 5th Eurobitume & Euroasphalt Congress, Istanbul, Turkey 2012

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