PG Grading and Emulsion Residue Testing

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PG Binder Testing

Tests:

What are the tests?
How are they performed?
What do they mean?
PG Binder Testing

PG is short for Performance Graded

A PG graded asphalt will have 2 numbers (Example PG 64-16)
PG Binder Testing

- The first number is the temperature at which the pavement can reach before permanent deformation will occur.

- The second number is the temperature at which the low temperature cracking will occur.
PG Binder Testing

- Flash Point
- Solubility in Trichloroethylene
- Rotational Viscosity
- Rolling Thin Film Oven Aging
- Pressure Aging Vessel Conditioning
- Dynamic Shear Rheology
- Bending Beam Rheology
- Ductility (Caltrans)
PG Binder Testing

- Flash Point
  - Run primarily for safety issues
PG Binder Testing

- Solubility in Trichloroethylene
  - Run to determine if particulate matter is present
PG Binder Testing

- Rotational Viscosity
  - Workability of the mix
Rotational Viscosity
PG Binder Testing

- Rolling Thin Film Oven Aging
  - Simulates the aging of the asphalt after it has been run through a hot plant
PG Binder Testing

- Pressure Aging Vessel Conditioning
  - Simulates the aging of an asphalt after it has been on the road for a number of years
PG Binder Testing

- Dynamic Shear Rheology
  - Controlling data for determining the “upper” temperature of the PG binder
  - Also is used in conjunction with the Bending Beam Rheology in determining the “low temperature of the PG Binder
Dynamic Shear Rheology
PG Binder Testing

- Bending Beam Rheology
  - Controlling data for determining the “low temperature” of the PG Binder
PG Binder Testing

- Ductility (RTF-O aged)
  - Used as indicator of homogeneity
  - Used as an indicator of fatigue
Emulsion Residue Testing

- Absolute Viscosity
- Penetration
- Softening Point
- Torsional Recovery
- Elastic Recovery
- Ductility
Emulsion Residue Testing

- Absolute Viscosity
  - A measurement of the asphalt stiffness
Emulsion Residue Testing

- Penetration
  - A measurement of the asphalt stiffness
Emulsion Residue Testing

- Softening Point
  - A measurement of the asphalt stiffness
Emulsion Residue Testing

- Ductility (RTF-O aged)
  - Used as indicator of homogeneity
  - Used as an indicator of fatigue
Emulsion Residue Testing

- Elastic Recovery
  Verifies that there are elastomeric properties
Emulsion Residue Testing

- Torsional Recovery
  Verifies that there are elastomeric properties
Torsional Recovery
Thank you