

Fall 2022 Performance Graded Asphalt Binder Proficiency Samples 269 (A) and 270 (B) Instructions for Testing and Reporting

[Closing Date: October 27th, 2022](#)

All tests should be conducted on each of the two samples according to the AASHTO or ASTM Standard Methods indicated. Please treat each sample as you would typically treat a QA/QC type sample. Report the results of a single determination only, not the average of two or more, except in cases where an average is called for in the method or specification (R29). For any tests you do not choose to perform, leave the appropriate spaces on the data sheet blank.

Note: The material provided for this round of testing is a modified asphalt binder having a performance grade of PG 76E-22.

TESTS ON ORIGINAL BINDER

Specific Gravity (Relative Density) of Bituminous Materials, AASHTO T228-09 or ASTM D70-21: Determine the specific gravity at **25°C** relative to water at **25°C**. Report the results to the nearest 0.0001 gravity unit.

Flash Point by Cleveland Open Cup, AASHTO T48-18 or ASTM D92-18: Report the flash point to the nearest degree Celsius (estimated). Correct the observed value for barometric pressure if necessary. If a skin should form, move it carefully aside with a glass rod or spatula and continue with the determination of the flash point. Please note this condition under “comments” or “feedback” when results are submitted.

Rotational Viscosity, AASHTO T316-19 or ASTM D4402-15: Determine the viscosity at **135°C** using the Rotational Viscosity apparatus. Report the viscosity to the nearest 0.001 Pa·s.

Dynamic Shear Rheometer (DSR), AASHTO T315-20 or ASTM D7175-15: Determine the complex shear modulus (G^*) and the phase angle (δ) at **76°C**, using a frequency of 10 rad/s, a 25 mm plate, a 1 mm gap and the strain or stress values specified in the method. Report G^* to the nearest 0.01 kPa, δ to the nearest 0.1 degree and $G^*/\sin \delta$ to the nearest 0.01 kPa.

Elastic Recovery of Asphalt Materials by Means of a Ductilometer, AASHTO T301-13 or ASTM D6084-21 (Procedure B): Test three specimens (briquettes). Use a test/bath temperature of **25°C**. Pull the specimen clips at a speed of 5 cm /min (2 in./min) to an elongation of 20 cm. Report the average percent elongation recovery (percent elastic recovery) of the three specimens to the nearest 0.1 percent.

Ash Content of Asphalt and Emulsified Asphalt Residues, D8078-18e1:
Report the ash content of the unconditioned asphalt binder to the nearest 0.01%.

TESTS ON RTFO RESIDUE

Rolling Thin-Film Oven Test, AASHTO T240-21 or ASTM D2872-21: Change in Mass: Determine the masses of the samples and containers to the nearest milligram (0.001 g). Report, to the nearest 0.001 percent, the average change in mass of the material. **Please use a negative number to report a mass loss and a positive number to report a mass gain.**

Dynamic Shear Rheometer (DSR), AASHTO T315-20 or ASTM D7175-15: Determine the complex shear modulus (G^*) and the phase angle (δ) at **76°C**, using a frequency of 10 rad/s, a 25 mm plate, a 1 mm gap and the strain or stress values specified in the method. Report G^* to the nearest 0.01 kPa, δ to the nearest 0.1 degree and $G^*/\sin \delta$ to the nearest 0.01 kPa.

Multiple Stress Creep Recovery of Asphalt Binder Using a Dynamic Shear Rheometer, AASHTO T350-19 or ASTM D7405-20: Perform testing at **76°C** using a 25 mm plate and a 1 mm gap. Report the average percent recovery at 0.1 kPa ($R_{0.1}$) and 3.2 kPa ($R_{3.2}$), and the percentage difference between average percent recovery at 0.1 kPa and 3.2 kPa (R_{diff}), to the nearest 0.01 percent. Report the non-recoverable creep compliance at 0.1 kPa ($J_{nr0.1}$) and 3.2 kPa ($J_{nr3.2}$) to three significant figures (kPa^{-1}) and percent difference between non-recoverable creep compliance at 0.1 kPa and 3.2 kPa ($J_{nr-diff}$) to the nearest 0.01 percent.

TESTS ON PAV RESIDUE

Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV), AASHTO R28-21 or ASTM D6521-19a: Condition the asphalt binder at a temperature of **100°C** using the pressurized aging vessel (PAV).

Dynamic Shear Rheometer (DSR), AASHTO T315-20 or ASTM D7175-15: Determine the complex shear modulus (G^*) and the phase angle (δ) at **31°C**, using a frequency of 10 rad/s, an 8 mm plate, a 2 mm gap and the strain or stress values specified in the method. Report G^* to the nearest kPa, δ to the nearest 0.1 degree and $G^* \cdot \sin \delta$ to the nearest kPa.

Bending Beam Rheometer (BBR), AASHTO T313-19 or ASTM D6648-08: Determine the flexural creep stiffness and estimated slope (m) of **two trial beams** for Sample A and Sample B at **-12°C**. Report the creep stiffness and estimated slope for Trials 1 and 2, and **their averages** for both Samples A and B. Report the estimated creep stiffness after 60 s in MPa to three significant figures and the average value of the estimated slope (m) to the nearest 0.001.