
Standard Practice for Certifying Suppliers of Performance-Graded Asphalt Binders

AASHTO Designation: R 26-01 (2013)



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1. SCOPE

- 1.1. This standard specifies requirements and procedures for a certification system that shall be applicable to all suppliers of performance-graded asphalt binder (PGAB). The requirements and procedures shall apply to materials that meet the requirements of M 320, Section 5, Materials and Manufacture, and that are manufactured at refineries, mixed at terminals, in-line blended, or modified at the hot mix asphalt (HMA) plant.
- 1.2. *This standard may involve hazardous materials, operations, and equipment. It does not purport to address all of the safety problems associated with this use. The user of this standard shall be responsible for appropriate safety and health practices.*

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
 - M 320, Performance-Graded Asphalt Binder
 - R 28, Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)
 - R 29, Grading or Verifying the Performance Grade (PG) of an Asphalt Binder
 - R 66, Sampling Asphalt Materials
 - T 48, Flash and Fire Points by Cleveland Open Cup
 - T 313, Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)
 - T 315, Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)
 - T 316, Viscosity Determination of Asphalt Binder Using Rotational Viscometer
- 2.2. *ASTM Standards:*
 - D8, Standard Terminology Relating to Materials for Roads and Pavements
 - D3665, Standard Practice for Random Sampling of Construction Materials

3. TERMINOLOGY

- 3.1. *AAP*—AASHTO accreditation program.
- 3.2. *agency*—shall be defined as a state highway agency or other agency responsible for the final acceptance of the PGAB.
- 3.3. *AS*—approved supplier.

- 3.4. *ASC*—approved supplier certification.
- 3.5. *asphalt binder*—an asphalt-based cement that is produced from petroleum residue either with or without the addition of nonparticulate organic modifiers.
- 3.6. *PGAB*—performance-graded asphalt binder.
- 3.7. *quality control testing*—the quality control testing shall be described in the supplier’s quality control plan. The supplier’s quality control plan shall be approved by the agency.
- 3.8. *specification compliance testing*—complete testing in accordance with the M 320 specification requirements. The procedure for verification of PGAB as described in R 29 shall be followed.
- 3.9. *supplier*—shall be defined as one who produces the final product or who makes the blend or modification that alters the properties of the PGAB specified in M 320. A supplier shall be a refinery, a terminal, or an HMA producer. If no modification is made to the PGAB after its initial production at the refinery, the refinery shall be the supplier and must provide the certification. If any modifications are made to the PGAB at the terminal, the terminal shall be the supplier and must provide certification. If any modification, blending, or blending of PGAB from different sources is made at the HMA plant, the HMA producer shall be the supplier and must provide the certification.
- Note 1**—Various refining techniques can produce equivalent PGAB; however, these asphalts may be incompatible with each other. Users shall consider compatibility before combining asphalts from different sources.
- Note 2**—Definitions for many terms common to asphalt binder are found in ASTM D8.

4. SIGNIFICANCE AND USE

- 4.1. This standard specifies procedures for minimizing disruption of PGAB shipments. This is accomplished by a certification system that evaluates quality control and specification compliance tests performed by the supplier on samples obtained prior to shipment.
- 4.2. The number of PGAB available under M 320 may require construction of additional storage facilities if the procedure of “sample and hold while testing” is followed exclusively. The addition of new storage capacity at a facility may be infeasible at some locations. Standardization of procedures that allow shipment under an approved supplier certification provides the flexibility needed to use existing facilities and to limit the shipment disruptions.
- 4.3. This standard provides information on the following activities:
- 4.3.1. General requirements that the supplier shall satisfy to be given approved-supplier status;
 - 4.3.2. Minimum requirements that shall be included in a supplier’s quality control plan;
 - 4.3.3. General requirements that the agency shall satisfy before certification;
 - 4.3.4. Procedure for shipping PGAB under an ASC system;
 - 4.3.5. Procedure for agency monitoring of an ASC system at the shipping facility; and
 - 4.3.6. Procedure for field sampling and testing of PGAB shipped under an ASC system.

5. HAZARDS

- 5.1. The safety requirements of the field and/or laboratory organization and/or OSHA shall be observed.

6. SAMPLING

- 6.1. All test samples required by this standard shall be obtained in accordance with R 66 and ASTM D3665. The use of a random sampling procedure is mandatory to the establishment of a valid certification program.

7. TESTING REQUIREMENTS

- 7.1. Testing required for this standard shall be performed by a laboratory currently accredited by the AAP. Any satellite laboratory of a supplier that performs required testing under this standard shall be identified in the AS quality control plan (Section 9) and shall be approved by the agency.
- Note 3**—Cost of this inspection shall be borne by the source of data. Satellite laboratories may be inspected by the source's primary AMRL inspected laboratory staff. A copy of the report of the satellite laboratory inspection shall be provided with the test report, if requested.

8. SUPPLIER REQUIREMENTS

- 8.1. The supplier shall submit a written request to the agency for authorization to ship PGAB under the ASC system and shall list the PGAB to which the request applies.
- 8.2. The supplier shall allow the agency to visit the production and/or shipping site to observe the supplier's quality control activities, to inspect the facilities, and to obtain samples for test.
- 8.3. The supplier shall submit to the agency for approval a complete quality control plan, which complies with the requirements of Section 9.
- 8.4. The supplier shall follow the procedures described in the approved quality control plan.
- 8.5. The supplier shall establish a continuing test record for each test required on each PGAB included in the written request prepared to satisfy the requirements of Section 8.1.
- 8.6. The supplier shall forward to the agency the initial series of test data for each performance grade included in the written request prepared to satisfy the requirements of Section 8.1. The supplier shall also obtain and provide a split sample for the agency, if requested.
- 8.7. The supplier shall submit to the agency all reports required by this standard in a form approved by the agency. A sample of an acceptable worksheet and standard report form is shown in Figures 1 and 2.

SAMPLE ID: _____

Rotational Viscosity:

Test Temperature: 135°C C Spindle #: _____ Speed: 20 RPM
 Three Readings/1-min intervals: _____
 Average: _____ cP X 0.001 = Pa•s
 Note: 1cP = 0.001 Pa•s

Rolling Thin-Film Oven Residue:

Time in oven: _____ (+85 min) Time out of oven: _____
 Bottle number _____
 Weight of bottle and asphalt: _____ G _____ g
 Weight of bottle: _____ G _____ g
 Weight of asphalt before heating: _____ G _____ g
 Asphalt and bottle after heating: _____ G _____ g
 Mass loss (-) or gain (+): _____ G _____ g
 Percent loss (-) or gain (+): _____ % _____ %
 Average percent loss or gain %

Pressure Aging Vessel Residue:

Time in: _____ (+20 h) Time out: _____
 Aging test temperature, nearest 0.1°C: _____
 Maximum and minimum aging temperature recorded, nearest 0.1°C:
 Max: _____
 Min: _____
 Total time during aging that temperature was outside the specified
 range, nearest 0.1 min: _____ N/A
 Total aging time, hours and minutes: _____

Bending Beam Rheometer:

Sample ID:	_____	_____	_____	_____	_____
Time poured:	_____	_____	_____	_____	_____
Time trimmed:	_____	_____	_____	_____	_____
Time in bath:	_____	_____	_____	_____	_____
Time tested:	_____	_____	_____	_____	_____

Direct Tension Time:

Sample ID:	_____	_____	_____	_____	_____
Time poured:	_____	_____	_____	_____	_____
Time trimmed:	_____	_____	_____	_____	_____
Time in chamber:	_____	_____	_____	_____	_____
Time tested:	_____	_____	_____	_____	_____

Figure 1—Sample Worksheet

Project:		Supplier:	
Sample:		Comments/requests:	
Tech:			
Date:		Performance grade:	

Original Binder

Flash Point Temp (T 48): Min 230°C		°C
Rotational Viscosity (T 316): Max 3 Pa•s @ 135°C		Pa•s
Dynamic Shear (T 315): G*/sin (delta), min 1.00 kPa: Test temp @ 10 rad/s, °C:	 	kPa °C

RTFO Residue

Percent Change, (1.00% max loss):		%
Dynamic Shear (T 315): G*/sin (delta), min 2.20 kPa: Test temp @ 10 rad/s, °C:	 	kPa °C

PAV Residue

(R 28), 20 h @ 2.07 MPa		
Dynamic Shear (T 315): G*/sin (delta), Max 5000 kPa: Test temp @ 10 rad/s, °C:	 	kPa °C
Creep Stiffness (T 313): S, Max 300 Mpa Test temp @ 60 s, °C m-value, Min 0.300	 	MPa °C
Direct Tension (T 314): Failure strain, Min 1.0%: Test temp @ 1.0 mm/min, °C	 	% °C

Figure 2—Performance-Graded Binder Test Results According to M 320

- 8.8. The supplier shall have a satisfactory record of compliance with governing specifications. Judgments by the agency concerning this requirement shall be based on the test results furnished by the supplier and satisfactory results when the monitoring and field tests are compared with supplier tests.

9. SUPPLIER QUALITY CONTROL PLAN—MINIMUM REQUIREMENTS

- 9.1. The supplier's quality control plan shall identify the following:
- 9.1.1. Facility type (refinery, terminal, in-line blending, or HMA plant);
 - 9.1.2. Facility location;
 - 9.1.3. Name and telephone number of the person responsible for quality control at the facility;
 - 9.1.4. The quality control tests to be performed on each PGAB; and
 - 9.1.5. Name and location of the laboratory performing quality control tests on the PGAB that is shipped.
- 9.2. The supplier's quality control plan shall include a declaration stating that if a test result indicates that a shipment of PGAB is not in compliance with the purchase specifications, the supplier shall (1) immediately notify the agency of the shipment in question; (2) identify the material; (3) cease shipment until material complies with the specification; (4) notify the agency prior to resuming shipment; and (5) implement any mutually agreed-upon procedures for the disposition of the material. In the event a mutual agreement is not obtained, the specifying agency shall have final authority in the decision on specification compliance.
- 9.3. The supplier's quality control plan shall describe method and frequency for initial testing, quality control testing, and specification compliance testing.
- 9.3.1. *Initial Testing*—For each grade of PGAB to be supplied, specification compliance testing (complete M 320 testing) shall be performed for at least three consecutive lots. A lot may be a fixed batch of material or a specified quantity in a continuous operation (see Note 4). The supplier and the agency shall agree on a lot size. The agency must approve any change to a lot size.
Note 4—If a batch operation is used to manufacture the PGAB, a tank may be defined as a lot. Lot size would be the amount of material batched into the tank. If a continuous process (in-line blending or a shipment from “live” tanks) is used to manufacture the PGAB, lot size may be obtained at random during the production for continuous operations. Lot size shall depend on the production method used and the quantity of the PGAB produced.
 - 9.3.2. *Reduced Frequency of Testing for Specification Compliance*—If approved by the agency, the frequency of testing for specification compliance may be decreased if the individual M 320 test result for every sample of the initial testing is within specification by at least the tolerance of the test method for each of the required test methods. With the approval of the agency, the frequency of testing may be further reduced as long as the individual test results continue to meet the tolerance criterion. If the tolerance criterion is not met, every lot will continue to be tested for the individual M 320 property until three consecutive lots comply with the tolerance criterion.
 - 9.3.3. *Minimum Frequency*—Specification compliance testing shall be run at the minimum frequency required by the agency for each PGAB that is supplied.
 - 9.3.4. *Quality Control Testing for Guiding Manufacturer*—At least two M 320 tests shall be used for monitoring high- and low-temperature properties of the PGAB. Non-M 320 tests may be used for guiding manufacturer, if approved by the agency. The use of non-M 320 tests does not preclude

the need to meet M 320 specifications or to run complete M 320 tests according to the guidelines in Section 9.3.

- 9.4. The supplier's quality control plan shall include a statement that the supplier will prepare monthly summary reports for all quality control and specification compliance tests performed during that period and will submit them to the agency on request.
- 9.5. The supplier quality control plan shall provide an outline of the procedure to be followed for checking transport vehicles before loading to prevent contamination of shipments. The outline shall include a statement that the transport vehicle inspection report, signed by the responsible inspector, shall be maintained in the supplier's records, and will be made available to the agency on request.
- 9.6. The supplier shall submit a written request to the agency for authorization to use in-line blending of additives that meet Section 5 of M 320 at the HMA plant to produce PGAB. With the request, the supplier shall submit (1) a sample of the additives; (2) a sample of the base binder materials; (3) a notice of the proportions that will be used; and (4) the M 320 test results for the base binder material and for the blended binder material determined under the requirements of Section 8.
- 9.6.1. The supplier, if an HMA producer, shall submit a detailed plan for QC at the HMA plant. The QC plan shall conform to the procedure established in Section 9.3 with the following modifications: (1) the initial testing shall be conducted on the modified binder that is sampled beyond the in-line blending point, and (2) the supplier shall keep a record of the proportions, based on mass or other indicators. The supplier and agency shall agree on the frequency for recording the proportions. (See Section 3.6.)

Note 5—For additives that do **not** meet the requirements of Section 5, M 320, the supplier may submit a written request to the agency for authorization to use solid additives that are to be added directly to the mix at the asphalt batch plant or the drum mix plant. With the request, the supplier shall submit (1) a sample of the additives; (2) a sample of the base binder materials; (3) a notice of the proportions that will be used; and (4) the M 320 test results for the base binder material and for the blended binder material, as applicable under M 320, determined under the requirements of Section 8.

M 320 and the test procedures may not be applicable for some of the solid additives because of their size range after blending with the base binder or other characteristics of the modifier. If the binder fails to meet any of the criteria under Section 5 of M 320, acceptance of the binder shall be at the discretion of the agency. Supplier and agency shall therefore agree on the test methods to be used. The agency may allow the use of M 320 tests or may require testing of the resultant HMA using selected test procedures to assure the level of performance expected.

The supplier shall submit a detailed plan for QC at the HMA plant. The QC plan shall conform to the procedure established in Section 9.3 with the following modifications: (1) initial testing shall be conducted on a laboratory blend of the solid additive and the binder to be added at the HMA plant; (2) the supplier shall keep a record of the proportions, based on mass or other indicators; and (3) the supplier and agency shall agree on the frequency for recording the proportions.

Note 6—*Reclaimed Asphalt Pavement (RAP)*—The HMA producer may submit a written request to the agency for authorization to add RAP to the mix at the HMA plant to meet the PGAB specified. With the request, the HMA producer shall submit (1) a sample of the RAP; (2) a sample of the base binder materials; (3) a notice of the proportions that will be used; and (4) the M 320 test results for the base binder material and for the blended binder material determined under the requirements of Section 8.

The HMA producer shall submit a detailed plan for QC at the HMA plant. The QC plan shall conform to the procedure established in Section 9.3 with the following modifications: (1) initial testing shall be conducted on a laboratory blend of the asphalt cement extracted from the RAP sample, any addition of additive, and the binder material that is to be added at the HMA plant;

(2) the HMA producer shall keep a record of the proportions, based on mass or other indicators; and (3) the HMA producer and agency shall agree on the frequency for recording the proportions. The agency may waive the requirement for testing the laboratory-blended binder and may use other guidelines for selecting the performance grade of the new binder relative to the amount of RAP used.

10. AGENCY REQUIREMENTS

- 10.1. The agency shall verify that the supplier's quality control plan is adequate. The agency may visit the shipping site when required.
- 10.2. The agency shall notify the supplier that the supplier's application for AS status has been granted. The notification shall include a list of the PGAB covered.
- 10.3. The agency shall verify that the supplier's primary testing laboratory is currently AASHTO accredited.
- 10.4. The agency may perform split sample testing in accordance with Section 12.
- 10.5. The agency may perform quality assurance sampling and testing in accordance with Section 13.
- 10.6. The agency shall authorize shipment of each listed PGAB under the ASC system only after all ASC system requirements have been satisfied.
- 10.7. The agency shall inspect the operations of the supplier's facility related to the PGAB shipments when required.
- 10.8. The agency shall notify the supplier when split sample data versus supplier sample data do not compare within the limits established in Sections 12 and 13.
- Note 7**—The supplier and/or the HMA producer may take a split sample for comparison purposes. If a split sample is taken, a third sample shall be taken as a referee. The referee sample shall be retained either by the agency or by the HMA producer until the test results are available. If the test results are disputed, the agency and supplier shall agree upon a test procedure for the referee sample.

11. REQUIREMENTS FOR SHIPPING PGAB BY AN APPROVED SUPPLIER

- 11.1. The supplier's quality control plan as approved by the agency shall be implemented (see Section 9).
- 11.2. The supplier shall make PGAB shipments covered by the certification as dictated by shipping schedules.
- 11.3. Each shipment shall be accompanied by two copies of the bill of lading, which shall include (1) the name and location of the supplier; (2) the performance grade of material; (3) the quantity of material shipped; (4) the date of shipment; (5) a statement certifying the material meets specification requirements; and (6) a statement certifying that the transport vehicle was inspected before loading and was found acceptable for the material shipped.
- Note 8**—On any invoice or bill of lading, it is recommended that metric tons be used as the primary unit of measurement.

- 11.4. If the specification compliance test results do not conform to PGAB specifications, the supplier shall remove the noncompliant material from the shipping queue as outlined in Section 9.2.
- 11.5. Based on the agency's split sample testing on the referee sample (see Note 7), price adjustment may be made for material that does not comply with the specified PGAB requirements. The price adjustment shall be determined by the agency. If problems with the PGAB recur at the HMA plant, the agency may suspend use of the PGAB until the cause for noncompliance with specifications can be identified and corrected.

12. SPLIT SAMPLE TESTING

- 12.1. The agency may test split samples that are obtained at random from the supplier's facility.
Note 9—Split samples will be obtained from the same general points in the supplier's shipping process from which the supplier's samples are taken, for example, from a storage tank at the refinery, from a holding tank at a terminal, or from a loading line downstream from the blending operation of an in-line blending process.
- 12.2. The agency shall determine the frequency of split sample testing.
- 12.3. If the split sample data and the supplier test data are not within the test tolerance specified (see Section 15), an immediate investigation shall be conducted to determine the reason for the difference between the data. Unless available facts indicate otherwise, the investigation shall include a review of sampling and testing procedures of both supplier and agency.

13. FIELD SAMPLING

- 13.1. The agency or HMA producer may design the field-sampling plan to accomplish the intended purpose.
Note 10—Field samples may be taken for several different purposes: to determine the type and magnitude of any changes in the properties of the PGAB during transportation and storage; to determine that the material received in the field is the material ordered; or to verify that the quality control/quality assurance system is performing as intended.
- 13.2. The agency may obtain samples from the field facility on a random basis for the purpose of quality assurance.
- 13.3. The agency shall determine a minimum frequency of field sampling that shall be adequate to satisfy the purpose for which the field samples are taken.
- 13.4. If the field test data are not within tolerance, the agency shall immediately notify the approved supplier and HMA producer. Unless available facts indicate otherwise, an investigation shall be conducted that shall include a review of quality control and sampling and testing procedures for field sampling and split sampling. When the differences are not readily resolved, all facts available to identify the problem shall be used to decide on an appropriate course of corrective action.
- 13.5. If the PGAB fails to comply with the specification, the supplier or HMA producer shall immediately investigate the possibility of contamination in transport vehicles, field storage tanks, pumps, lines, and at handling facilities. If the cause is determined, correction shall be made promptly. If field test data show a serious departure from the specifications, the supplier or HMA producer shall delay the project work pending corrective action.

14. REPORT AND DATA SHEETS

- 14.1. *Supplier Reports*—The supplier shall prepare the reports described in Sections 8.1, 8.3, 8.6, 8.7, 9.2, 9.4, 9.5, 11.2, and 11.3.
- 14.2. *Agency Reports*—The supplier may request copies of the split sample test results and field test data.

15. KEYWORDS

- 15.1. Approved Supplier (AS); Approved Supplier Certification (ASC); certification system; certified shipments; Performance-Graded Asphalt Binder (PGAB) Certification.