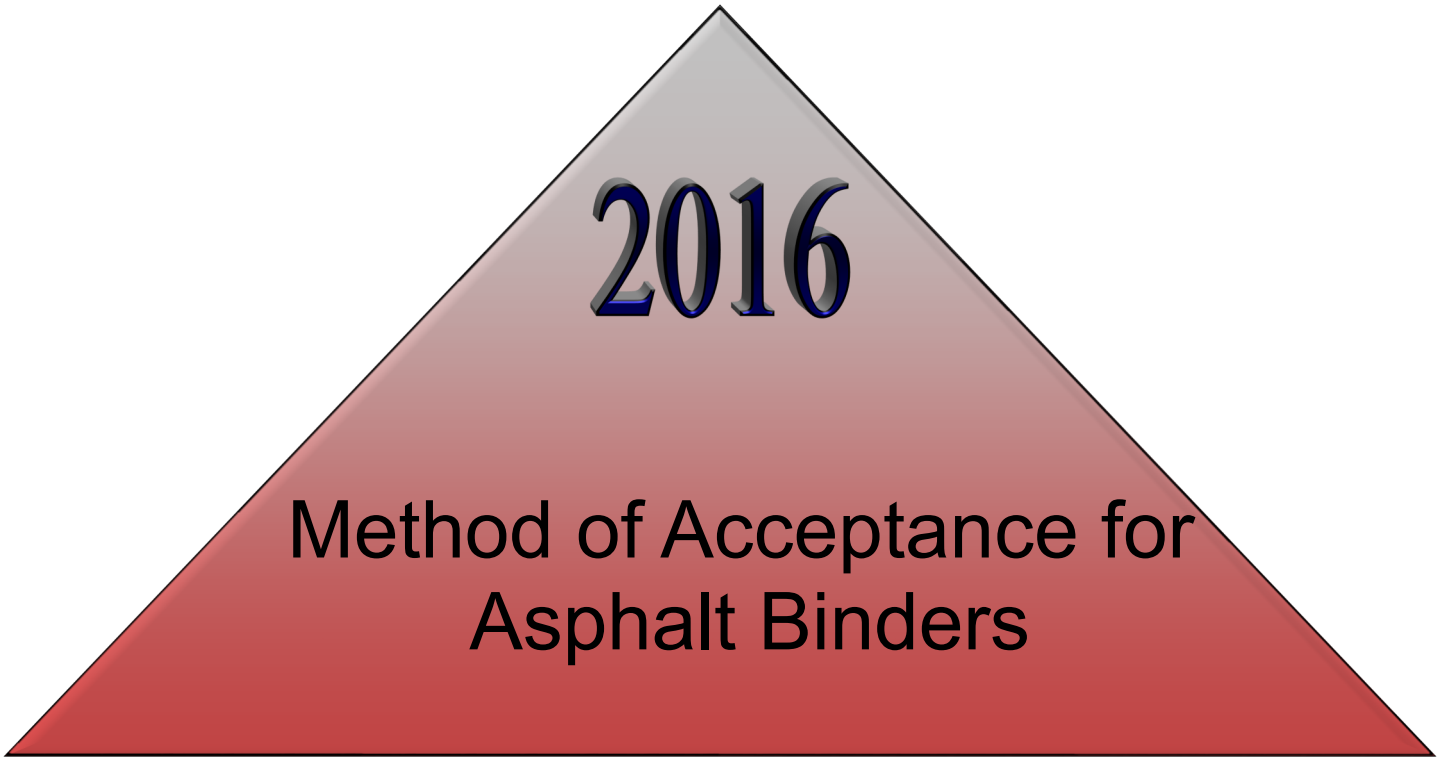
Combined State Binder Group



Iowa Department of Transportation
Minnesota Department of Transportation
Nebraska Department of Roads
North Dakota Department of Transportation
South Dakota Department of Transportation
Wisconsin Department of Transportation

Revisions of the 2015 edition of the Combined State Binder Group Method of Acceptance for Asphalt Binders for 2016.

Page 2; Definitions for Additive, Modifier, Project/Job
Page 3; III. LOSS OF CERTIFICATION, A; Removed consecutive job site
Page 3; III. LOSS OF CERTIFICATION, A Added project
Page 5; V. SAMPLING AND TESTING BY SUPPLIER; B. Daily Requirements; 3; Removed, indicated differently
Page 5; V. SAMPLING AND TESTING BY SUPPLIER; B. Daily Requirements; 3; Added, directed
Page 5; V. D; Combined State Binder Group Quarterly “Round-Robins”; 1, Removed WIDOT
Page 5; V. D; Combined State Binder Group Quarterly “Round-Robins”; 1, Added Combined State Binder Group
Page 5; V. D; Combined State Binder Group Quarterly “Round-Robins”; 3, Removed WIDOT representative
Page 5; V. D; Combined State Binder Group Quarterly “Round-Robins”; 3, Added e-mail address
Page 5; V. D; Combined State Binder Group Quarterly “Round-Robins”; 4, Removed WIDOT
Page 5; V. D; Combined State Binder Group Quarterly “Round-Robins”; 4, Added Combined State Binder Group

Revisions of the 2015 edition of the Combined State Binder Group Method of Acceptance for Asphalt Binders for 2016. (continued)

Page 5; V. D; Combined State Binder Group Quarterly “Round-Robins”; 5, Removed WIDOT
Page 5; V. D; Combined State Binder Group Quarterly “Round-Robins”; 5, Added Combined State Binder Group
Page 5; V. D; Combined State Binder Group Quarterly “Round-Robins”; 6, Added Scot Schram at (scott.schram@dot.iowa.gov)
Page 10; Wisconsin; Removed; The sampling rate will be a minimum of one (1) per 800 Mg (900 tons) for each supplier and grade of asphalt binder, or fraction thereof, per contract. For contracts with less than approximately 23 Mg (25 tons) (one truck transport) of asphalt, sampling may be waived.
Page 10; Wisconsin; Added; For projects greater than 1,000 ton of mix, a truck transport sample at a rate of one-liter (one-quart) sample per 15,000 mix tons for each supplier and grade of asphalt binder, or fraction thereof, per contract. Additionally, one random sample, by In-line sample, of the binder is required per project. For contracts with 1,000 ton or less of mix, one (1) random sample of the binder by In-line sample may be required per project, at the discretion of the project engineer.
Page 10; Wisconsin; Removed; Sampling method shall be accomplished by taking a one-liter (one-quart) sample of material representing the middle third of the load from a sample valve attached to the transport in accordance with AASHTO Designation T40 section 10 paragraph 10.1 or other department approved supplier method as outlined in the QC plan
Page 10; Wisconsin; Added; A. Truck Transport sampling:
Page 10; Wisconsin; Added; B. In-Line Sampling
Page 16; Added; Combined State Binder Group Certified Supplier List

Important Notification

Intended AASHTO M332 Implementation time frame by State Members

IOWA: Feb/March 2016 JNR,

MINNESOTA: Beginning January 1, 2016, all project design will use AASHTO M332 (MSCR) binder specification as referenced in MnDOT Special Provisions for Specifications 3151 - Bituminous Material and 2360 - Plant Mixed Asphalt Pavement. Projects already let, or designed prior to January 1, 2016 and to be let, may still use binders specified in current MnDOT Standard Specifications for Construction, which use AASTHO M320 binder specification.

NEBRASKA: No specified date has been set for implementation of AASHTO M332.

NORTH DAKOTA: No specified date has been set for implementation of AASHTO M332

SOUTH DAKOTA: No specified date has been set for implementation of AASHTO M332

WISCONSIN: Starting with April 2016 lets, all project designs will use AASHTO M332 (MSCR) specification for the testing of asphalt binders. Contracts let before this date, and carry over projects from 2015 will be tested under AASHTO M320.

COMBINED STATE BINDER GROUP
CERTIFICATION METHOD OF ACCEPTANCE
FOR ASPHALT BINDERS

Acceptance of asphalt binder by the **Certification Method** provides for acceptance of these materials for use on Iowa, Minnesota, Nebraska, North Dakota, South Dakota, and Wisconsin Department of Transportation/Roads (Department) projects upon the producer's or supplier's certification that the product as furnished to the contractor (or purchasing agency) complies with the pertinent specification and/or contract requirements.

Department projects include state, county, and municipal federal aid and authorized county and municipal state aid projects. In order to provide asphaltic material to Department projects under the **Certification Method**, a supplier[1], as defined below, shall comply with the following procedures and requirements.

I. GENERAL REQUIREMENTS

The supplier shall have laboratory facilities and qualified personnel available to perform all specification tests and maintain an acceptable quality control program. The supplier shall maintain records of all its control testing done in the production of asphaltic materials. These test records shall be available at all times for examination by the Departments' designated representative[2] and for a period of five (5) years after use on a project.

The supplier shall inspect each transport tank prior to loading to insure suitability for loading and freedom from contaminants.

Continuing acceptance of materials under this process is contingent upon satisfactory compliance with procedures and conformance of materials to requirements as determined by test results for source samples and field samples taken by project personnel.

The tolerances as shown in the "Performance Graded Binder and Test Method Tolerances" Table on pages 17 and 18 are for use by the Department when comparing to supplier data. All data received from the supplier is expected to meet the base specification values shown in the Table, unless it is agreed upon that a bias exists, based on the results of the Combined State Binder Group Quarterly Round Robins.

If an acid modification process or a modifier (as defined below), not including additives (as defined below), is used, the supplier shall assign the modifying process with a unique name and

[1] Supplier-A Supplier shall be defined as one who produces or supplies the final product or makes a blend or modification that alters the properties of the PGAB specified in M320 or M332, prior to final shipment to Department projects. A Supplier may be a refinery, a terminal, secondary storage facility, or an HMA producer. 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 conform to the requirements of this document. If one certified supplier sells to another certified supplier and material is delivered directly to a project, the supplier selling the material to the second supplier is responsible for submitting the daily and bi-weekly QC data to the DOT/DOR's as required by the CSBG document section V.B & V.C.

[2]Hereinafter in this document, the usual designated Department Representatives (contact persons) are listed on pages 13 and 14 of this document.

type of modification to be provided to the department for tracking and monitoring purposes. [If liquid anti-strip agent is added, or modifying is done at the HMA plant, the HMA producer is considered a supplier (see footnote 1, page 1) and must conform to this document's requirements. Full test results with and without anti-strip in the asphalt binder at the required dosage will be required before production begins].

A. Definition

Additive A material blended with the asphaltic binder (e.g., liquid anti-strip, warm mix additive, adhesion aid, etc.) or the aggregate (e.g., lime, hydrated lime, cement, etc.) to enhance the characteristics of the final blend of hot mix asphalt, but does not result in altering the performance grade of the binder

Modifier A material blended with the asphaltic binder to enhance the characteristics of the asphaltic binder, accomplished by modifying the performance grade of the binder (e.g., polymers, bio oils, rejuvenators, etc.)

Project/Job The point of placement or production of the product being used. The place the product is being incorporated into the pavement structure. This includes the production facility making the mix for placement on a given road.

II. QUALIFYING FOR CERTIFICATION

Suppliers requesting certified status for supplying material from their individual facilities shall make application in writing to the Department's representative, who will arrange for and authorize the use of the **Certification Method of Acceptance.** This request should present complete information regarding the supplier's quality control program (control tests, testing frequencies, laboratory facilities, programs for maintaining test and shipment records, etc.).

A supplier's certification will remain in effect until denied by the certification program authority or until subsequent re-approval following another inspection. A yearly application in writing need not be made.

Department records will be used to provide a quality history of suppliers. If no quality history exists, one may be established by a cooperative, comprehensive sampling and testing program to ensure that quality control practices are effective.

It is intended that facility inspections will be made each spring by the Department. The inspections will include reviewing sampling and testing procedures, quality control, and facility changes. Also, at this time, the identification and inspection of tanks will be done. Suppliers shall designate and identify tanks that will be used for supplying each grade of asphaltic material for Department projects. The Department inspector will verify that the storage and sampling procedures will be adhered to.

Suppliers will have their requests for certification approved by the Department.

The Departments' Districts/Regions will be notified when suppliers become certified.

The Department inspector shall be permitted to visit asphalt facilities any time during working hours and in the company of appropriate supplier personnel.

Certification of a supplier by one of the Combined State Binder Group members will be accepted by all the member states.

III. LOSS OF CERTIFICATION

Certification will be withdrawn from suppliers when one or more of the following conditions exist.

A. Inability to consistently supply material meeting specifications as measured by non-compliance for three (3) project samples according to Department test results for a specific grade.

B. Failure to participate in four (4) Combined State Binder Group "Round-Robins" during any one year. Exceptions will be made for equipment failure. Labs will be required to respond with resolution of equipment failure(s), as detailed in Subsection V.D.6.

C. Failure to respond to notification of outlying labs in writing within the given timeframe, as detailed in Subsection V.D.5.

D. Lack of maintenance of required records.

E. Improper documentation of shipments as defined in Section VII.

F. Failure to maintain an acceptable quality control program.

G. Failure to provide quality control testing data as required by the **Certification Method.**

Decertification of suppliers will be by the Department. Notification will be in writing.

If a supplier loses certification, materials may be accepted, for a 3-month period as defined in section IV qualifying for recertification, according to specific procedures agreed to by the Department and supplier. Procedures may require pre-testing and approval of materials before use and/or increasing the frequency of sampling and testing at the job site (refer to Section VIII.B. of this procedure). The Department's costs for pre-testing and increasing sampling and testing of materials will be paid by the supplier/contractor or their agent unless other arrangements are agreed upon by the Department.

IV. QUALIFYING FOR RECERTIFICATION

If a supplier has lost certification and seeks to be recertified the following is required:

- Fulfill the requirements of Section II, "Qualifying for Certification", of this procedure.

- Submit documentation to the Department's Representative explaining why decertification occurred and the actions the supplier has taken to correct the problems identified by the Department.

A maximum of three-months (of normal production) will be allowed for a supplier to regain certified status under this procedure. If, after that time, the Department determines that the supplier has not attained satisfactory status for certification, material from that source will not be accepted for use on Department projects. The Departments' district/regions will be notified of this action. Decisions regarding the future qualification for certification of a supplier, affected by the above process, shall be at the Department's discretion.

V. SAMPLING AND TESTING BY SUPPLIER

A. Minimum Annual Requirements

1. Prior to the start of the shipping season, adequate testing shall be performed to identify characteristics of tank materials on-hand. Before or at the start of shipping, bi-weekly sample testing (see sub-section V.C.3) shall be completed on a minimum of one sample for each grade of asphaltic material anticipated to be shipped to Department projects.

2. It is intended that facility annual inspections would be made at this time.

3. Participation in Combined State Binder Group "Round Robin" Program will be a requirement, as detailed in Subsection V.D.

This testing will constitute the minimum annual requirements by the Certification method of Acceptance Program for continuation of a supplier certification.

B. Daily Requirements

1. Sampling. One sample from the tank or blender representing each grade of material shipped for Department work. For material shipped from tanks, the sample may be taken from the tank, from the line during loading, or from the loaded transport. Material produced from a blender may be sampled from the line during loading or from the loaded transport.

2. Test required. **Performance graded binder**: penetration, any viscosity measurement or dynamic shear. Dynamic shear testing will be required if material is modified.

3. Report. Send a record of daily quality control results to the Department central laboratory on an approximate bi-weekly basis unless otherwise directed by the department.

C. Bi-Weekly Requirements

1. Sampling. Sample as for B.1.

2. Tests required. All of the tests listed in the attached schedule of tests for **performance graded binder** material.

3. Report. Send report of test results to the Department central laboratory when completed.

D. Combined State Binder Group Quarterly "Round-Robins"

1. General. Combined State Binder Group will send a "Round Robin" PG-Binder sample to each supplier, approximately every three (3) months, with a maximum of four (4) samples annually.

2. Purpose. To provide data about the repeatability and reproducibility of the applicable PG binder test methods.

3. Report. Send a report of test results to the designated e-mail address when completed.

4. Summary. The Combined State Binder Group will compile a summary report and distribute to all participants. Each supplier's data will remain confidential.

5. Notification of Outliers. The Combined State Binder Group will notify "Round-Robin" participants of any tests for which their data was determined to be a statistical outlier. An outlier is defined as that data which is outside of three standard deviations from the average. The determination of outliers is an iterative process. The notification will be sent in an e-mail to the participant. The participant shall have 30 days to provide MNDOT with a response as to the apparent cause of the outlier. This information will be shared with the other Departments.

6. Equipment Failures. Labs will be required to respond to the Combined State Binder Group in an e-mail to Scot Schram at (scott.schram@dot.iowa.gov) with resolution to equipment failures. This information will be shared with the other Departments.

VI. TEST REPORTS (required by Section V)

The supplier chief chemist (or other representative) shall certify test reports for samples and submit them to the Department's Representative. This test information will be evaluated and filed for possible future reference. The reports shall be sent to:

IOWA:
Iowa Department of Transportation
Office of Construction and Materials
800 Lincoln Way
Ames, IA 50010
Attn: Scott A Schram, Ph.D., P.E.
Bituminous Engineer
scott.schram@dot.iowa.gov

MINNESOTA:
Minnesota Department of Transportation
Office of Materials and Road Research
1400 Gervais Avenue
Maplewood, MN 55109
Attn: Paul Lohmann, Transportation Specialist
E-Mail: paul.lohmann@state.mn.us

NEBRASKA:
Nebraska Department of Roads
Materials and Tests Division
1400 NE Hwy 2
Lincoln, NE 68509-4759
ATTN: Dale Byre
E-Mail: Dale.Byre@nebraska.gov

NORTH DAKOTA:
North Dakota Department of Transportation
Materials and Research Division
300 Airport Road
Bismarck, ND 58504
ATTN: Jeff Herman
E-Mail: jherman@nd.gov

SOUTH DAKOTA:
South Dakota Department of Transportation
Materials Laboratory
104 S. Garfield, Bldg B
Pierre, SD 57501
ATTN: Rick Rowen
E-Mail: rick.rowen@state.sd.us

WISCONSIN: Wisconsin Department of Transportation
Truax Center
ATTN: Richard Barden, Asphalt Certification Specialist
3502 Kinsman Boulevard
Madison, WI 53704
E-Mail: Richard.Barden@dot.wi.gov

VII. CERTIFICATION OF SHIPMENTS AND DOCUMENTATION

For each truck shipment, a shipping ticket (Bill of Lading) shall be prepared showing the supplier, location, grade of asphaltic material, unique name (as referenced in Section I, paragraph 5, page 2), additives (silicone or anti-strip), truck number, supplier's tank number from which the truck was loaded, average unit weight, quantity, and date and time of loading. In addition, Iowa DOT requires contract or project number on the shipping ticket. A statement certifying that the material complies with Combined State Binder Group requirements and Department Specifications shall be on or accompany the shipping ticket. The company invoice or manifest form may be used for this purpose.

In addition to the usual contractor's copy of the shipping ticket, a copy (South Dakota DOT to receive two copies) of the shipping ticket containing the certification language for each truck shipment also shall be made available to the project engineer.

The Department's Representative will furnish a list of certified suppliers to the districts/regions.

Only material shipped from a certified supplier directly to the job site will be accepted as certified material. Material shipped to, and unloaded into, a secondary storage facility and subsequently shipped to Department projects will **not** be accepted as certified material unless that secondary facility has been certified and is operating in full compliance with these procedures. Modification at HMA plant will not be accepted unless the plant is certified as a supplier.

The Departments project personnel must be notified of PG grade and/or supplier changes.

VIII. SAMPLES OBTAINED BY THE STATE

A. Refinery/Terminal Samples

The Department shall have the option to obtain random samples at the source of supply. Samples shall be taken by supplier personnel at the request and under observation of an authorized Department representative. The supplier shall have equipment and facilities available to obtain samples safely.

B. Verification Field Samples

IOWA:

The supplier or contractor personnel will obtain samples, under the observation of a Department representative, of material at the job site. The sampling rate will be one per day. For contracts with less than approximately 40 Mg (45 tons) of asphalt, sampling may be waived.

Sampling shall be accomplished in accordance with Iowa Instructional Memorandum (I.M.) 323, "Method of Sampling Asphaltic Materials".

In addition, project personnel will obtain samples as directed by the project engineer to adequately monitor material quality at the plant for alterations made to the site storage, HMA plant handling process, or if modification is occurring at the HMA plant.

MINNESOTA:

The supplier or contractor personnel will obtain samples, under the observation of a Department representative, by random selection from shipments of material at the job site. The samples shall be taken from the first load and subsequently one sample per 900 Mg (1000 tons) for each supplier and grade of asphalt binder per contract. For contracts with less than approximately 23 Mg (25 tons) (one truck transport) of asphalt, sampling may be waived.

Sampling shall be accomplished by taking a one-liter (one-quart) sample of material from a transport in accordance with AASHTO Designation R 66.

In addition, project personnel will obtain samples as directed by the project engineer to adequately monitor material quality at the plant for alterations made to the site storage, HMA plant handling process, or if modification is occurring at the HMA plant.

NEBRASKA:

The Contractors Certified Sampling Technician will obtain samples, under the observation or assistance of the Department representative, of material at the job site. The sampling rate will be a minimum of one (1) per 3750 tons of Hot Mix Asphalt produced for each supplier and grade of Performance Graded Binder per contract. A minimum of one (1) sample will be taken per project.

One Sample will consist of two (2) one-liter (one-quart) cans of material taken from the line between the storage tank and mixer or from the tank supplying material to the line, at a location at which material sampled is representative of the material in the line to the mixer. Sampling shall be accomplished in accordance with AASHTO R66.

In addition, project personnel will obtain samples as directed by the project engineer to adequately monitor material quality whenever blending of binders of different grades or binders from different suppliers is taking place. These samples will be taken at the start of production following the blending at locations defined above.

NORTH DAKOTA:

NDDOT project personnel will observe the contractor obtain samples from material delivered to the job site. The sampling rate will be a minimum of one sample for every 250 tons (225 Mg) for each supplier and grade of asphalt cement, or fraction thereof. The sample shall be taken randomly within each 250 tons (225 Mg) of material.

A sample will consist of taking two 1-liter (one-quart) samples from the designated transport. The first sample will be used for testing; the second sample will be a check. Both samples will be sent to the NDDOT Central Lab.

Samples will be identified with the following information written on the can:

-Project Number-Field Sample Number
-Manifest Number-PG Grade
-Asphalt Supplier-Date
-Original or Check

Project personnel will also obtain samples as directed by the project engineer at any time extra samples are determined to be necessary.

SOUTH DAKOTA:

The supplier or contractor personnel will obtain samples, under the observation of a Department representative, of material at the job site. The sampling rate will be in accordance to the South Dakota Department of Transportation Materials Manual, "Minimum Sample and Test Requirements", section 1.1C. (3).

The sampling method will be in accordance to SD 301 section 3.2C in the South Dakota Department of Transportation Materials Manual.

In addition, project personnel will obtain samples as directed by the project engineer to adequately monitor material quality at the plant for alterations made to the site storage, HMA plant handling process, or if modification is occurring at the HMA plant.

WISCONSIN:

The supplier or contractor personnel will obtain samples, under the observation of a Department representative, by random selection from shipments of material at the job site. For projects greater than 1,000 ton of mix, a truck transport sample at a rate of one-liter (one-quart) sample per 15,000 mix tons for each supplier and grade of asphalt binder, or fraction thereof, per contract. Additionally, one random sample, by In-line sample, of the binder is required per project. For contracts with 1,000 ton or less of mix, one (1) random sample of the binder by In-line sample may be required per project, at the discretion of the project engineer.

A. Truck Transport:
Sampling shall be accomplished by taking a one-liter (one-quart) sample of material representing the middle third of the load from a sample valve attached to the transport in accordance with AASHTO Designation R66 section 13 paragraph 13.3.2.

B. In-Line:
Sampling shall be accomplished by taking a one-liter (one-quart) sample of material from an in-line sample port between the storage tank and mixer as described in AASHTO Designation R66 section 8 paragraph 8.2.2.

In addition, supplier or contractor personnel, under the observation of Department representative, will obtain samples as directed by the project engineer to adequately monitor material quality at the HMA plant for alterations made to the site storage, HMA plant handling process, or if modification is occurring at the HMA plant.

IX. ACCEPTANCE OF ASPHALT BINDER NOT ON THE APPROVED LIST

It is the intention of the Departments to encourage suppliers to become certified according to this procedure. However, if situations occur where a supplier is not on the Departments' approved list, materials may be accepted for a designated interim period according to specific procedures agreed to by the Department and supplier. Procedures may require pretesting and approval of materials before use and/or increasing the frequency of sampling and testing at the job site (refer to Section VIII.B. of this procedure). The Department's costs for pretesting and increased sampling and testing of materials will be paid by the supplier/contractor or their agent unless other arrangements are agreed upon by the Department.

X. SAMPLES TESTED BY THE STATE WITH NON-COMPLYING RESULTS

Should a sample tested by the Department show noncompliance, actions will be taken to investigate the sample failure. The purpose of the investigation(s) will be to quickly obtain information to either substantiate the failure data or to provide conclusive evidence that the reported failure is unreliable. There are two types of samples to be considered: 1) refinery/terminal random samples taken by the supplier in accordance with the quality control plan under observation of an authorized Department representative at the shipping refinery or terminal, and 2) verification field samples taken under the direction of the Department's project personnel at the job site. The processes to resolve sample failures for each of the two types of samples are as follows:

A. Refinery/Terminal Samples

If a sample obtained by an authorized Department representative at a supplier Refinery/Terminal shows test results out of specification limits, the process of resolving the sample failure will include the following actions as appropriate:

1) The Department will notify the supplier.

2) The Department and supplier together will determine the quantity and location(s) of the material in question.

3) The Department will retest the sample as determined necessary to confirm or disaffirm the original test result(s).

4) If material is in transit to or at Department projects, the district/region(s) will be notified.

5) The Department may increase the frequency of sampling at the project site(s) involved.

6) The Department will investigate and review all pertinent test data.

7) The Department's Representative will collect and compile all information,

including any from the supplier and district/region(s), and prepare a report with explanations to resolve the sample problem. A copy of the report will be distributed to the district/region, contractor, and supplier.

8) The supplier shall take corrective action, as warranted, and submit an explanation to the Department.

9) The Department will determine when the sample is adequately investigated and resolved and the supplier is consistently furnishing specification material.

B. Verification Field Samples

If a sample obtained by the Department at a project site shows test results out of specification limits, the process of resolving the sample failure will include the following actions as appropriate:

1) The Department will notify the district/region and determine that the information sent with the sample is correct and the sample does indeed fail. The district/region will notify the contractor. The district/region will arrange for project personnel to investigate all aspects of procuring, handling, and submitting the sample for testing. The quantity and location of material in question will be determined. The district/region will report findings to the Department's Representative.

2) The Department will conduct retesting of the sample as determined necessary to confirm or disaffirm the original test result(s).

3) The Department will notify the supplier who will arrange to investigate all aspects of loading, handling, and delivery of the material in question. The supplier shall report findings to the Department's Representative.

4) The Department will increase the frequency of sampling at the project site.

5) The Department's Representative will collect and compile all information from the district/region and supplier investigations and prepare a report. The Department will determine when the sample has been adequately investigated. The report will contain data with an analysis of information and recommendations for the district/region to resolve the sample problem. A copy of the report will be distributed to the district/region, contractor, and supplier.

6) The Department will issue the standard report of tests for the sample showing the failing test result(s).

7) The district/region will make the final decision for resolving the sample problem. Generally, the district/region will accomplish this with input from the Department Representative, and supplier. The Department's report of investigations (from step 5 above) will be used in the decision making

process. The district/region will notify the contractor. Should the decision involve credit payment for material(s) in question, standard Department practices will be followed and administered by the district/region. The contractor will be notified in writing of credit payments.

8) The supplier shall implement corrective measures suggested by the investigation work and notify the Department of actions taken.

9) The Department will implement changes in this procedure determined to be warranted by the investigation work.

DEPARTMENT REPRESENTATIVES:

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Minnesota Department of Transportation
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Copies of this document can be obtained from:

North Central Superpave Center Home Page: http://bridge.ecn.purdue.edu/~spave/

WISDOT's ftp site: ftp://ftp.dot.wi.gov/dtsd/bts/quality/general

Any Combined State Binder Group representative.

SCHEDULE OF TESTS
AS REQUIRED BY THE COMBINED STATE BINDER GROUP

TEST	TEST METHOD
PERFORMANCE GRADED BINDER	
Solubility	AASHTO - T44
Flash Point	AASHTO - T48
Brookfield Viscosity	AASHTO – T316
Dynamic Shear	AASHTO – T315
Rolling Thin Film Oven Test: a. Change of Mass b. Dynamic Shear	AASHTO - T240 AASHTO – T315
Accelerated Aging (PAV) a. Dynamic Shear b. Creep Stiffness	AASHTO – R28 AASHTO – T315 AASHTO – T313
Multiple Stress Creep Recovery (MSCR) Test of Asphalt Binder Using a Dynamic Shear Rheometer	AASHTO – T 350
Direct Tension	AASHTO – T314

NOTES:

1. All testing shall be in accordance with the applicable standard methods of the American Association of State Highway and Transportation Officials (AASHTO) or American Society of Testing and Materials (ASTM).

Combined State Binder Group Certified Supplier List

SUPPLIER	LOCATION	SUPPLIER	LOCATION
Asphalt Materials, Inc.	Cicero, IL	Frontier Refining, Inc.	Cheyenne, WY
Barton Enterprises	Newport, MN	Gardner-Gibson	Willow Springs, IL
Bit Mat Products	South Bend, IN	Henry G. Meigs, LLC	Abbotsford, WI
Bituminous Matr'l & Supply	Des Moinse, IA	Henry G. Meigs, LLC	Portage, WI
Bituminous Matr'l & Supply	Tama, IA	Husky Energy	Lloydminster, Alberta
BKEP Materials, LLC	Grand Island, NE	Husky Energy	Winnipeg, Manitoba
Blueknight Energy Partners	Commerce City, CO	Husky Energy (Ponder Emulsions)	Yorkton, Sask
Border Chemical	Winnipeg, Manitoba	Interstate Asphalt Corp-Ameripan	Chicago, IL
BP Products North America, Inc.	Bartlett, IL	Interstate Asphalt Corp-Bell Oil	Chicago, IL
BP Products North America, Inc.	Calumet, IL	Interstate Asphalt Corp	Peoria, IL
BP Products North America, Inc.	Whiting, IN	Jebro, Inc.	Carson, SD
Calumet Superior Specialty Products	Crookston, MN	Jebro, Inc.	Sioux City, IA
Calumet Superior Specialty Products	Great Falls, MT	Marathon Ashland Petroleum	Meredosia, IL
Calumet Superior Specialty Products	Rhinelander, WI	McAsphalt Ind., Inc.	Thunder Bay, Ontario
Calumet Superior Specialty Products	Superior, WI	McAsphalt Ind., Inc.	Winnipeg, Manitoba
CHS	Grand Forks, ND	Midwest Industrial Asphalt	LaCrosse, WI
CHS	Hardin, MT	Monarch Oil	Omaha, NE
CHS	Laurel, MT	Moose Jaw Refinery, Inc.	Moose Jaw, Sask
CHS	Mandan, ND	Northern Tier Energy-St. Paul Refinery	St. Paul, MN
Const. Resources Mngt., Inc.	Gladstone, MI	Phillips 66	Forestview, IL
Const. Resources Mngt., Inc.	Green Bay, WI	Phillips 66	Granite City, IL
Const. Resources Mngt., Inc.	Milwaukee, WI	Phillips 66	Kansas City, MO
Const. Resources Mngt., Inc.	Waukesha, WI	Pioneer Oil Co.	Billings, MT
ExxonMobil	Billings, MT	Seneca Petroleum Co., Inc.	Lemont, IL
Flint Hills Resources, LLC	Algona, IA	Seneca Petroleum Co., Inc.	Portage, IN
Flint Hills Resources, LLC	Davenport, IA	Stark Pavement Corp.	Milwaukee, WI
Flint Hills Resources, LLC	Dubuque, IA	Texpar Energy	Davenport, IA
Flint Hills Resources, LLC	Green Bay, WI	Texpar Energy	Rochester, MN
Flint Hills Resources, LLC	Marshall, MN	Tri County Paving, Inc.	DeForest, WI
Flint Hills Resources, LLC	Omaha, NE	Tri-State Asphalt, LLC	Morris, IL
Flint Hills Resources, LLC	Rosemount, MN	Westway Terminal Company, Inc.	St. Paul, MN
Flint Hills Resources, LLC	Savage, MN		
Flint Hills Resources, LLC	Stevens Point, WI		
Flint Hills Resources, LLC	West Fargo, ND		

Combined State Binder Group

Method of Acceptance for Asphalt Binders

PERFORMANCE GRADED BINDER SPECIFICATIONS & TEST METHOD TOLERANCES

(IOWA, MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA & WISCONSIN DOT'S & NEBRASKA DOR)

EFFECTIVE January 2015 **AASHTO M320**

PERFORMANCE GRADE				PG 46-			PG 52-							PG 58-					PG 64-						PG 70-						PG 76-					PG 82-				
				34	40	46	10	16	22	28	34	40	46	16	22	28	34	40	10	16	22	28	34	40	10	16	22	28	34	40	10	16	22	28	34	10	16	22	28	34
AVERAGE 7 DAY MAXIMUM PAVEMENT DESIGN TEMP, °C					46					52						58						64					70						76					82				
MINIMUM PAVEMENT DESIGN TEMPERATURE, °C [a]				-34	-40	-46	-10	-16	-22	-28	-34	-40	-46	-16	-22	-28	-34	-40	-10	-16	-22	-28	-34	-40	-10	-16	-22	-28	-34	-40	-10	-16	-22	-28	-34	-10	-16	-22	-28	-34
TESTS ORIGINAL BINDER	SPEC BASE	SPEC W/TOL	TOL																																						
AASHTO T44 SOLUBILITY																																								
% MINIMUM	99.00	98.87	0.13																																						
AASHTO T48 FLASH POINT																																								
TEMP, °C, MINIMUM	230	221	9		230					230						230						230					230						230					230				
AASHTO T316 VISCOSITY [b]																																								
Pa.s MAXIMUM	3.0	3.2	7.3%																																						
TEST TEMP, °C										135						135						135					135						135					135				
AASHTO T315 DYNAMIC SHEAR [c]																																								
G*/SINδ [d], kPa, MINIMUM	1.00	0.93	7%																																						
TEST TEMP @ 10 rad/sec, °C					46					52						58						64					70						76					82				
TESTS RTFO RESIDUE																																								
AASHTO T240 MASS CHANGE [e], % MAX	1.00	1.20	20%																																						
AASHTO T315 DYNAMIC SHEAR [c]																																								
G*/SINδ [d], kPa, MINIMUM	2.20	1.98	10%																																						
TEST TEMP @ 10 rad/sec, °C					46					52						58						64					70						76					82				
AASHTO T350 MSCR AASHTO TP 70 [h] % Recovery @ 3.2 kPa MIN																																								
Test Temperature @ 58°C [i]																	30					30	55				55	55	75					75	75				75		
Test Temperature @ 64°C [i]																	25					25	45				45	45	75					75	75				75		
TESTS PAV RESIDUE																																								
AASHTO R28 PAV AGING TEMP, C [f]					90					90						100						100					100 (110)						100 (110)					100 (110)				
AASHTO T315 DYNAMIC SHEAR																																								
G*SINδ [d], kPa, MAXIMUM	5000	5600	12%																																						
TEST TEMP @ 10 rad/sec, °C				10	7	4	25	22	19	16	13	10	7	25	22	19	16	13	31	28	25	22	19	16	34	31	28	25	22	19	37	34	31	28	25	40	37	34	31	28
AASHTO T313 CREEP STIFFNESS [g]																																								
[S] MAXIMUM, MPa	300	324	8%																																						
m-VALUE, MINIMUM	0.300	0.285	5%																																						
TEST TEMP @ 60s, °C				-24	-30	-36	0	-6	-12	-18	-24	-30	-36	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	0	-6	-12	-18	-24
AASHTO T314 DIRECT TENSION [g]																																								
FAILURE STRAIN, MINIMUM %	1.0	0.8	20%																																						
TEST TEMP @ 1.0 mm/min, °C				-24	-30	-36	0	-6	-12	-18	-24	-30	-36	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	0	-6	-12	-18	-24

Use to verify the presence of Polymer	Spec Base			Spec w/tol			Tol
Temperature Spread [i]	92	98	104	92	98	104	
Phase Angle; degrees (Maximum) (Original Binder)	77.0	75.0	73.0	79.0	77.0	75.0	2.6%

a PAVEMENT TEMPERATURES ARE ESTIMATED FROM AIR TEMPERATURES USING AN ALGORITHM CONTAINED IN THE LTPP BIND PROGRAM, MAY BE PROVIDED BY THE SPECIFYING AGENCY, OR BY FOLLOWING THE PROCEDURES AS OUTLINED IN MP2 AND PP28.

b THIS REQUIREMENT MAY BE WAIVED AT THE DISCRETION OF THE SPECIFYING AGENCY IF THE SUPPLIER WARRANTS THAT THE ASPHALT BINDER CAN BE ADEQUATELY PUMPED AND MIXED AT TEMPERATURES THAT MEET ALL APPLICABLE SAFETY STANDARDS.

c FOR QUALITY CONTROL OF UNMODIFIED ASPHALT CEMENT PRODUCTION, MEASUREMENT OF THE VISCOSITY OF THE ORIGINAL ASPHALT CEMENT MAY BE USED TO SUPPLEMENT DYNAMIC SHEAR MEASUREMENTS OF G*/sinδ AT TEST TEMPERATURES WHERE THE ASPHALT IS A NEWTONIAN FLUID.

d G*/sinδ = HIGH TEMPERATURE STIFFNESS AND G*sinδ = INTERMEDIATE TEMPRATURE STIFFNESS.

e THE MASS CHANGE SHALL BE LESS THAN 1.00 PERCENT FOR EITHER A POSITIVE (MASS GAIN) OR A NEGATIVE (MASS LOSS) CHANGE

f THE PAV AGING TEMPERATURE IS BASED ON SIMULATED CLIMATIC CONDITIONS AND IS ONE OF THREE TEMPERATURES 90ºC, 100ºC, OR 110ºC. NORMALLY THE PAV AGING TEMPERATURE IS 100ºC FOR PG 58-XX AND ABOVE. HOWEVER, IN DESERT CLIMATES THE PAV AGING TEMPERATURE FOR PG 70-XX AND ABOVE MAY BE SPECIFIED AS 110ºC.

g IF THE CREEP STIFFNESS IS BELOW 300 MPa, THE DIRECT TENSION TEST IS NOT REQUIRED. IF THE CREEP STIFFNESS IS BETWEEN 300 AND 600 MPa, THE DIRECT TENSION FAILURE STRAIN REQUIREMENT CAN BE USED IN LIEU OF THE CREEP STIFFNESS REQUIREMENT. THE m-VALUE REQUIREMENT MUST BE SATISFIED IN BOTH CASES.

h BINDERS SIGNIFIED BY PG XX-XXP SHALL BE REQUIRED TO MEET OR EXCEED THE MSCR MINIMUM % RECOVERY IN ADDITION TO M320 SPECIFICATIONS.

i TEST TEMPERATURE BASES ON ENVIRONMENTAL NOMINAL HIGH TEMPERATURE

Combined State Binder Group

Method of Acceptance for Asphalt Binders

SPECIFICATIONS & TEST METHOD

IOWA, MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA, WISCONSIN DOT'S & NEBRASKA DOR

EFFECTIVE JANUARY 2016

AASHTO M332

Performance Grade[a]				PG 46			PG 52							PG 58					PG 64					
Average 7-day max pavement design temp, °C[b]				46			52							58					64					
Min pavement design temp, °C[b]	Spec Base	Spec w/Tol	Tol	-34	-40	-46	-10	-16	-22	-28	-34	-40	-46	-16	-22	-28	-34	-40	-10	-16	-22	-28	-34	-40
Flash Point Temp, T 48, min °C	230	221	9	230			230							230					230					
Viscosity, T 316:[c] max 3 Pa•s test temp, °C	3.0	3.2	7.3%	135			135							135					135					
Dynamic Shear, T 315:[d] G*/sinδ, min. 1.00 kPa test temp @ 10 rad/s, °C	1.00	0.93	7%	46			52							58					64					
Rolling Thin Film Oven (T 240)																								
Mass change, max, percent[f]	1.00																							
MSCR, T 350: (Test Temperature °C)																								
Standard Traffic "S" $Jnr_{@3.2\ kPa}$, max 4.5 kPa^{-1} Jnr_{diff}, max 75%	4.5	5.49	22%	46			52							58					64					
Heavy Traffic "H" $Jnr_{@3.2\ kPa}$, max 2.0 kPa^{-1} Jnr_{diff}, max 75%	2.0	2.44	22%	46			52							58					64					
Very Heavy Traffic "V" $Jnr_{@3.2\ kPa}$, max 1.0 kPa^{-1} Jnr_{dif}, max 75%	1.0	1.39	39%	46			52							58					64					
Extremely Heavy Traffic "E" $Jnr_{@3.2\ kPa}$, max 0.5 kPa^{-1} Jnr_{diff}, max 75%	0.5	0.695	39%	46			52							58					64					
% Recov. @3.2 kPa (Min). Heavy Traffic "H"	30	24.6	18%	46			52							58					64					
% Recov. @3.2 kPa (Min). Vary Heavy Traffic "V"	55	45.1	18%	46			52							58					64					
% Recov. @3.2 kPa (Min). Extremely Heavy Traffic "E"	75	61.5	18%	46			52							58					64					
Pressure Aging Vessel Residue (R 28)																								
PAV Aging Temp[g], °C				90			90							100					100					
Dynamic Shear, T 315: "S" G*(sinδ), max. 5000 kPa[e] test temp @ 10 rad/s, °C	5000	5600	12%	10	7	4	25	22	19	16	13	10	7	25	22	19	16	13	31	28	25	22	19	16
Dynamic Shear, T 315: "H," "V," "E" G*(sinδ), max. 6000 kPa[e] test temp @ 10 rad/s, °C	6000	6720	12%	10	7	4	25	22	19	16	13	10	7	25	22	19	16	13	31	28	25	22	19	16
Creep stiffness, T 313:h S, max. 300 MPa	300	324	8%	-24	-30	-36	0	-6	-12	-18	-24	-30	-36	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30
m-value, min 0.300 test temp @ 60 s, ˚C	0.300	0.285	5%																					
Direct Tension, T 314:[h] Failure strain, min 1.0% test temp @ 1.0 mm/min, ˚C	1.0	0.8	20%	-24	-30	-36	0	-6	-12	-18	-24	-30	-36	-6	-12	-18	-24	-30	0	-6	-12	-18	-24	-30

a MSCR Test on RTFO residue should be performed at the PG grade based on the environmental high pavement temperature.
Grade bumping is accomplished by requiring a lower Jnr value while testing at the environmental temperature

b Pavement temperatures are estimated from air temperatures using an algorithm contained in the LTPP Bind program, may be provided by the specifying agency or by following the procedures as outlined in M 323 and R 35, excluding the provisions for "grade bumping."

c This requirement may be waived at the discretion of the specifying agency if the supplier warrants that the asphalt binder can be adequately pumped and mixed at temperatures that meet all applicable safety standards.

d For quality control of unmodified asphalt binder production, measurement of the viscosity of ther original asphalt binder may be used to supplement dynamic shear measurements of G/sinδ at the test temperatures where the asphalt is at Newtonian fluid.*

e G/sinδ = high temperature stiffness and G*sinδ = intermediate temperature stiffness.*

f The mass change shall be less than 1.00 percent for either a positive (mass gain) or a negative (mass loss) change.

g The PAV aging temperature is based on simulated climatic conditions and is one of three temperatures, 90˚C, 100˚C, or 110˚C. Normally the Pav Aging temperature is 100˚C. However, in desert climates the PAV aging temperature for PG 70-XX and above may be specified as 110˚C.

h If the creep stiffness is below 300 MPa, the direct tension test is not required. If the creep stiffness is between300 and 600 MPa, the direct tension failure strain requirementcan be used in lieu of the creep stiffness. The m-value requirement must be satisfied in both cases