



Idaho
**Transportation
Department**

*Mike Santi, P.E.
Assistant Materials Engineer*

*Rocky Mountain Pavement
Preservation Partnership Meeting
October 13-15, 2009*

Idaho Transportation Department

Emulsified Asphalt Quality Assurance Program

Idaho Transportation Department

QA Manual

230.11 Liquid or Emulsified Asphalt. The supplier will submit, on a yearly basis, a Process Control Plan (Quality Control Plan) to the Engineer and the Central Materials Laboratory for emulsified asphalt. A supplier's bill of lading will be furnished to the inspector with each load of liquid asphalt or emulsion supplied to the project. The bill of lading must contain the following information in accordance with Standard Specification Section 702.05 and 702.08:

Date of delivery, project number, key number, county, bill of lading number, and name of customer.

Product identification, tonnage, truck/trailer number, specific gravity, Saybolt viscosity for emulsified asphalt, and signed certification statement.

Supplier's name and address, phone number.

ITD project inspectors will sample only undiluted emulsified asphalt for verification testing in accordance with the individual bid schedule items in [Section 270.00](#) Minimum Testing Requirements. ITD project inspectors will perform field viscosity testing on sealcoat emulsions as required by the Minimum Testing Requirements in [Section 270.00](#) from the truck on the project site or at a location as close to the project as practical. The contractor must provide a safe means for obtaining the emulsion samples, including but not limited to fall protection, heat resistant clothing and gloves, etc.

Idaho Transportation Department

QA Manual

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Plan Objective

This plan is intended to communicate our reporting requirements to your agency, including the types and frequency of testing for our products, in order to provide an objective basis for certifying that our products meet your requirements.

Updates/Changes

This plan shall incorporate by reference correspondence that we may submit for the purpose of making changes to our plan. Experience with this plan may require future revisions, however, our products will be appropriately tested, certified and shipped according to this plan until we have made notifications of the revisions.

Quality Control Management Process

The following categories of testing are encompassed by this plan:

1. **Specification Compliance Testing** – means the battery of testing for asphalt product characteristics conducted to confirm that a product meets your agency specification. Appendices A and B outline our plan for the frequency of Specification Compliance Testing.
2. **Consistency Testing** – means the testing of key asphalt product characteristics at the time of manufacture and at other intervals. Appendices A and B outline our plan for Consistency Testing.

Quality Control Testing Location

Consistency Testing will be performed at the production facility or an alternate laboratory.

Specification Compliance Testing will be performed at an AMRL inspected laboratory, satellite laboratory, production facility, or external commercial laboratory.

Quality Control Tests

Testing will be performed in material conformance with AASHTO, ASTM, the applicable Idaho transportation department specification or other reasonably equivalent test methods.

Testing may be conducted prior to the addition of antistripping, fortification materials, and/or dilution as applicable.

Important Issues for You to Understand

For products produced by in-line blending:

1. We will monitor the components, adjust formulations, and verify final properties as outlined in the attached Appendices, or;
2. We will test the components prior to blending, and use the component test results to validate the finished product properties.

This plan provides for testing to be conducted in accord with Appendices A and B. If product testing is not completed for a batch of material shipped at the end of a test interval, the test results will be reported as a part of the results for the following interval.

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This plan provides for testing to be conducted in accord with Appendices A and B. If product testing is not completed for a batch of material shipped at the end of a test interval, the test results will be reported as a part of the results for the following interval.

Some properties of asphalt products begin to change immediately after they are manufactured. For materials that we expect will be shipped soon after they are manufactured, we may formulate a product so that its test characteristics are most likely to mature into conformance with the applicable specification at its expected time of application. For example, if our experience tells us that product viscosity will substantially drop after manufacture, we may formulate with a higher viscosity with the expectation that it will drop into the required range.

On occasion, you may request that non-conforming materials be shipped to meet deadlines or for other reasons. Products shipped in accord with such requests are deemed to comply with this plan.

Sampling

Samples will be taken to obtain product for testing that is representative of the nature and condition of the materials to be shipped. Samples will be labeled and retained for a reasonable period. Sampling procedures are available upon request.

Documentation and Reporting

Specification Compliance Testing will be recorded in writing as practical; however, some tests, e.g., tests requiring visual inspections, may not be documented in writing. Test data will be made available upon request.

Errors in Executing Our Plan

We intend to execute the provisions of this plan. If we make mistakes in executing our plan, we will notify you after our discovery.

Response to Off-Specification Incidents

For some types of products, test results are unavailable until after the product is shipped. We will notify you if we discover that off specification materials were used.

Contamination Prevention

We will follow procedures that make a reasonable attempt to prevent contamination of materials, and inquire as to the contents of our customers' tank trucks or cars.

We will not load a transport until we determine that contamination is unlikely. We cannot control contamination occurring after the material leaves our loading flange or spout. Contamination prevention procedures are available upon request.

Bill of Lading Documentation

Bills of lading will accompany each load shipped and shall reference the appropriate certification standard. Our certifications will provide that the material has been tested in accordance with this plan.

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Performance Graded Asphalt Binder - Idaho Agency Plan

Appendix A

PRODUCT	PG 58-22	PG 58-28	PG 58-34	PG 64-22	PG 64-28	PG 64-34	PG 70-22	PG 70-28	PG 76-28
Consistency Testing									
Specification Compliance									
ORIGINAL BINDER									
Flash Point, COC	A	A	A	A	A	A	A	A	A
Rotational Viscosity	M	M	M	M	M	M	M	M	M
DSR G*/Sin	W M	W M	W M	W M	W M	W M	W M	W M	W M
RTFO RESIDUE									
Mass Change	M	M	M	M	M	M	M	M	M
DSR G*/Sin	M	M	M	M	M	M	M	M	M
Elastic Recovery			M	M	M	M	M	M	M
PAV	M	M	M	M	M	M	M	M	M
PAV RESIDUE									
DSR G* Sin	M	M	M	M	M	M	M	M	M
BBR "m" value	M	M	M	M	M	M	M	M	M
BBR "s" value	M	M	M	M	M	M	M	M	M
Direct Tension	O	O	O	O	O	O	O	O	O

W = Tests performed at least once per week. Note: If only one production batch is produced in a given week or month only one set of tests may be performed.
M = Tests performed at least once monthly.
A = Test to be performed annually
O = Optional production specification that may be required by the agency per AASHTO M320.

- Consistency and Specification compliance testing will only be conducted while product is actively being manufactured and/or shipped.
- Testing frequencies are based on the use of consistent raw materials and production processes. Should the consistency of the raw materials or the production process change, testing frequency may be increased.
- Tests required on a time frequency, where the first loads shipped fall at the end of that time sequence, may have the correlating test data in the following time period.
- Test procedures may be either AASHTO, ASTM, Agency, or reasonable equivalents or modifications thereof.
- This testing frequency table intended to represent testing required by each agency in the state. Tests not required by specific agencies may not be tested.
- On rare occasions test results may be obtained after the frequency indicated.
- If test results are atypical and suspected to be misrepresentative of the material, then retesting will be initiated during which time product shipments may continue.

Emulsified Asphalt - Idaho Agency Plan

Appendix B

PRODUCT	CSS-1	CSS-1H	CRS-2	CRS-2H	CMS-3	CMS-3H	CMS-3S	CRS-3R	CRS-3P	CRS-3L	QUICK99 Concentrate	STE 1	CQS-1HP
Consistency Testing													
Specification Compliance													
Saybolt Viscosity	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M		D M	D M
Sieve Test	M	M	M	M	M	M	M	M	M	M		M	M
Storage Stability (1-day)	D		C	C	O	O	C	C	C	C		O	
Residue	M	M	M	M	M	M	M	M	M	M		M	M
Demulsibility			C	C			C	C	C	C		C	
Oil Distillate			M	M	M	M	M	M	M	M		M	M
Particle Charge/Identification	A	A	A	A	A	A	A	A	A	A		A	A
CSS emulsion Cement Mix	A	A											
Penetration	M	M	M	M	M	M	M	M	M	M		M	M
Ductility, 25°C	A	A	A	A	A	A	A	A	A	A		A	A
Ductility, 4°C													
Solubility	A	A	A	A	A	A	A	A	A	A		A	A
Toughness & Tenacity													
Softening Point													
Boil Off Residue	D	D	D	D	D	D	D	D	D	D		D	D
Screen Sieve	D	D	D	D	D	D	D	D	D	D		D	D

D = Test performed once per day only when that product has been manufactured during that day.
M = Tests performed at least once monthly. **Note:** If only one production batch is produced in a given week or month only one set of tests may be performed.
C = Tests performed at least once every quarter.
A = Tests performed at least once annually.

- Consistency and Specification compliance testing will only be conducted while product is actively being manufactured and/or shipped.
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- The solubility of the base asphalt prior to modification will be checked annually for each individual retinery source.
- CQS-1HP is also known as Ralumar.
- CRS-3P is a Washington DOT specified material.

Emulsified Asphalt - Idaho Agency Plan

Appendix B

PRODUCT	CSS-1	CSS-1H	CRS-2	CRS-2H	CMS-3	CMS-3H	CMS-3S	CRS-3R	CRS-3P	CRS-3L	QUICK99 Concentrate	STE 1	CQS-1HP
Consistency Testing													
Specification Compliance													
Saybolt Viscosity	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M		D M	D M
Sieve Test	M	M	M	M	M	M	M	M	M	M		M	M
Storage Stability (1-day)	D												
Residue	M	M	M	M	M	M	M	M	M	M		M	M
Demulsibility													
Oil Distillate													
Particle Charge/Identification													
CSS emulsion Cement Mix	A	A	A	A	A	A	A	A		A	A	A	A
Penetration	M	M	M	M	M	M	M	M	M	M	M	M	M
Ductility, 25°C	A	A	A	A	A	A	A	A					A
Ductility, 4°C													
Solubility	A	A	A	A	A	A	A						A
Toughness & Tenacity													
Softening Point									M				M
Boil Off Residue	D	D	D	D	D	D	D	D	D	D	D	D	D
Screen Sieve	D	D	D	D	D	D	D	D	D	D	D	D	D

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 - Q = Tests performed at least once every quarter.
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Specification Compliance													
EMULSION TESTS													
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Sieve Test	M	M	M	M	M	M	M	M	M	M		M	M
Storage Stability (1-day)	D	C	C	C	C	C	C	C	C	C		D	
Residue	M	M	M	M	M	M	M	M	M	M		M	M
Demulsibility			C	C								C	
Oil Distillate			M	M	M	M	M	M	M	M		M	
Particle Charge/Identification			C	C								C	
CSS emulsion	A	A	A	A	A	A	A	A		A	A	A	A
Cement Mix	A	A											
RESIDUE TESTS													
Penetration	M	M	M	M	M	M	M	M	M	M		M	M
Ductility, 25°C	A	A	A	A	A	A	A	A	A	A		A	A
Ductility, 4°C													
Solubility	A	A	A	A	A	A	A			A			A
Toughness & Tenacity													
Softening Point									M				M
OTHER TESTS													
Boil Off Residue	D	D	D	D	D	D	D	D	D	D	D	D	D
Screen Sieve		D	D	D	D	D	D	D	D	D		D	D

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Quality Control Plan

I. SCOPE

Integrated Asphalt Solutions, LLC (IAS, LLC) is located in Nampa, Idaho. It is an **AASHTO Accredited Laboratory** and has agreed to perform testing for all Performance Grade binders produced by **Idaho Asphalt Supply, Inc. (IAS, Inc.)** facilities, including emulsified asphalts where certification is required. IAS, LLC is a member of the **AASHTO Accreditive Program (AAP)**. Huachur (Dave) Zhai is the **Technical and Quality Manager**, and the principle liaison with IAS, Inc. plant facilities. IAS, Inc. plant managers are responsible to assure that products shipped are in compliance with customer requirements, including all relevant quality documentation specified in this plan. Satellite laboratories located at the respective plants perform and monitor plant processes as directed by the respective **Plant Manager**.

Questions on product quality should be addressed to the **Plant Manager** at the supplying location including any reports on **documented product nonconformance**. IAS, LLC Technical and Quality Manager should also be notified of said nonconformances. Satellite laboratories at Blackfoot and Hauser are to maintain all necessary documentation relevant to this plan, including a copy of this **Quality Control Plan (QCP)** and its implementation. This control plan is consistent with **AASHTO R36** document "Standard Recommended Practice for Certifying Suppliers of Performance-Graded Asphalt Binders."

Questions regarding this Quality Control Plan should be addressed to **Dave Zhai or Shou Hubert** at: 308-442-7742, fax: 308-453-0670 and email: hzhai@idahoasphalt.com or shou@idahoasphalt.com.

II. DOCUMENTATION, SHIPMENTS AND SPECIAL REQUIREMENTS

A. PERFORMANCE GRADED BINDERS

Typical standard lot size for Performance Grade (PG) materials at IAS Inc. plants is 800 tons (720 metric tons). All PG material lots will follow the same quality testing process (QTP) using standard **AASHTO R29** "Standard Practice for Grading and Verifying the Performance Grade of an Asphalt Binder". The QTP consists of sampling the lot, and measuring its original dynamic shear, penetration and retrolval viscosity properties. If the lot sample has passing values, then the full conformance test is initiated following R29 protocol and any additional test requirements. The customer and where applicable, the governing agency shall be notified when the lot is ready for shipment. IAS, Inc. will take any non-conforming/non-compliant material and reclassify it as a regular PG material. If applicable, a mutually agreed-upon procedure for disposing of the non-compliant material will be implemented and is the responsibility of the Plant Manager. Nonconforming products either returned by a customer or found in a tank shall be separated from acceptable materials and clearly identified.

B. EMULSIFIED ASPHALTS

Emulsified asphalts and other lot sizes can be manufactured as defined by the customer's purchase order and contract requirements. Emulsified asphalt quality control tests including a viscosity and a residue are performed on each run. At the end of the run, a final viscosity and a residue are performed. A standard practice is to sample the tank and test the emulsified asphalt product for viscosity and sieve to assure product stability.

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300	400
500	
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Laboratory Operations

ITD Central Laboratory

300.00

SECTION 350.00 ASPHALT LABORATORY

The Asphalt Laboratory is responsible for testing the quality of all bituminous products for highway construction projects and maintenance projects. The Asphalt Laboratory is AASHTO accredited and participates in American Materials Reference Laboratories (AMRL) proficiency testing.

350.01 Testing Procedures. Specifications governing the quality of asphalt are found in the ITD Standard Specifications for Highway Construction, [Subsection 700](#). All asphalt test methods are American Association of State Highway and Transportation Officials (AASHTO), with the exception of Detection of Anti-Strip Additive ([IT-99](#)) and Elastic Recovery (AASHTO T301).

Asphalt samples received by the Asphalt Laboratory for testing fall within five general types:

1. Performance Graded Binders
2. Cutback Asphalt
3. Transulfated Asphalt
4. Viscosity Graded Asphalt Concrete and Polymerized Asphalt Concrete
5. Special Products (Crack Filler, Bituminous Coatings, Anti-Strip Additive Approval, etc.)

Asphalt samples received from a project will be tested as complete or routine samples. Complete testing includes a series of tests as outlined in the next section. A routine test involves one or two tests.

350.01.02 Performance Graded Binders. Complete testing of Performance Graded Binders consists of the following tests found in AASHTO Standards:

Flash C.O.C.	T 48
Brookfield Viscosity	T 316
Dynamic Shear	T 315
Rolling Thin Film Oven Test	T 240
Dynamic Shear on RTU Residue	T 315
Pressure Aging Vessel	R 28
Dynamic Shear on PAV Residue	T 315
Bending Beam (Creep Stiffness)	T 313
Direct Tension	T 311
Elastic Recovery	T 301

[Idaho IT-99](#) is also performed as part of complete testing.

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100	200
300	400
500	
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Laboratory Operations 1113 Central Laboratory 300.00

350.02.03 Emulsified Asphalt.

Test Method	Deviation (-)		Price Adjustment
	% of Spec. Value		
	25°C (77°F)	50°C (122°F)	
Saybolt Viscosity	0 to 15	0 to 21	0%
	15.5 to 30	21.5 to 42	15%
	30.5 +	42.5 +	25%
<hr/>			
Residue by Evaporation	0 to 1		0%
	1.5 to 2		15%
	2.5 +		25%
<hr/>			
<u>Below Minimum</u>			
Penetration of Residue	0 to 16		0%
	16.5 to 24		15%
	24.5 +		25%
<hr/>			
<u>Above Maximum</u>			
	0 to 8		15%
	8.5 +		25%

When a failure occurs, any remaining samples representing that delivery ticket number must be tested. A price adjustment will be based on the contractor's supplier price.

From AASHTO T-59

Viscosity has significance in the use of emulsified asphalt because it is a property that affects utility. When used in application types of construction, the material must be thin enough to be uniformly applied through the spray bar of a distributor, yet thick enough so that it will not flow from the crown or grade of the road. For mixing-grade emulsified asphalt, the viscosity may affect the mixability and resulting thickness of film on the aggregate. The viscosity of emulsified asphalt may be affected by shear. Therefore, strict adherence to this test procedure is necessary to achieve precision.

























