

SUBCOMMITTEE ON MATERIALS

Mid-Year Web Meeting
Thursday, March 26, 2015
11:00 pm – 12:00 pm EST

TECHNICAL SECTION 2a Emulsified Asphalt

- 1) Call to Order and Opening Remarks [Ron Horner welcomed everyone.](#)
- 2) Roll Call
- 3) Approval of Technical Section Minutes [Motion to approve: VA, second: OR](#)
- 4) Old Business
 - a) SOM Ballot Items
 - i) **M 140 Emulsified Asphalt, 44-Yes, 2-No, 7-No vote** [Decision was made to re-ballot this in TS and again this fall due to the number of comments received.](#)

Editorial comments included as appropriate. Other comments:

Comment and Negative vote from: Texas Department of Transportation (Darren Hazlett)
[\(\[darren.hazlett@txdot.gov\]\(mailto:darren.hazlett@txdot.gov\)\)](mailto:darren.hazlett@txdot.gov) - **Negative**

It is confusing that there are three variants of HFRS-2 shown in the medium setting table, one of which is actually HFRS-2, which slightly different properties than the HFRS-2 in the rapid setting table. The HFRS-2s should either be MS or be in the rapid setting table.

Response:

This is a typographical error. The medium setting table should have all MS designations. [Change will be made editorially.](#)

Comment from: Mississippi Department of Transportation (James A. Williams)
[\(\[jwilliams@mdot.state.ms.us\]\(mailto:jwilliams@mdot.state.ms.us\)\)](mailto:jwilliams@mdot.state.ms.us)

Section 3.1 - The title of this section, "Requirements," indicates that the paragraphs should support and/or explain the requirements for the emulsified asphalt. The way Section 3.1 is worded; it relates more to the visual inspection, sampling, and the requirement to test the material within 14-days of the sample date. The information related to sampling should be moved to Section 4. The second sentence related to the appearance of the emulsion after thorough mixing could stay in Section 3.1. It is also recommended that a Note be added as information related to storage stability. Following is recommended wording of Section 3.1 and the note:

"Emulsified asphalt consists of base asphalt binder, water, and emulsifying agents. After thorough mixing, the emulsified asphalt should appear to be homogeneous. Upon receipt, the emulsified asphalt should be visually inspected to ensure that it has not been subject to freeze-thaw conditions and to assure that the emulsion has not separated during storage and shipping."

Note 1: Separation of emulsified asphalt can cause the material to be difficult to apply. Separation may result in an increase or decrease in the residual binder rate after application which can result in poor performance. Additionally, dilution of the emulsified asphalt to aid in the application of the material should not occur without approval of the buyer.

Section 4 - It is recommended that a Section 4.3 be added stating the following:

"Samples of emulsified asphalt shall be tested within 14 days of the sample date."

Response:

This comment and others that are similar offer good suggestions about wording, format, and clarification. (Similar comments were submitted for T 140, M 208 and M 316). The following wording is suggested.

"3.1 Upon receipt, refer to AASHTO T 59, Section 4, Sample Conditioning for Testing, for the proper protocol for reconditioning the emulsion prior to mixing and testing. The emulsion should appear to be homogeneous after thorough mixing at the appropriate temperature. Complete testing within 14 days of the sample date.

Note 2 - Dilution of the emulsified asphalt to aid in the application of the material should not occur without approval of the buyer.

3.1.1 If the emulsion appears to be inhomogeneous after reconditioning and mixing according to AASHTO T 59, discard and re-sample for testing if possible.

Note 3 - When emulsions (in particular, rapid-setting grades) are held in containers at ambient temperature for an extended period, emulsion droplets can coalesce, leading to unrepresentative changes in emulsion liquid properties. Coalescence can also lead to sieve development and, ultimately, destabilization of the emulsion. This can be noted as overall inhomogeneity of the sample even after careful re-heating and mixing upon receipt.

3.1.2 If the sample was subject to freeze-thaw cycling prior to receipt, discard and re-sample for testing if possible. If the emulsion was frozen at any time before testing, results for emulsion liquid properties such as viscosity, sieve, and settlement will be invalid.

Note 4 - Emulsion residue properties could also be affected when the liquid emulsion to be recovered shows signs of inhomogeneity or has been subjected to freeze-thaw cycling.

Note 5 - If the emulsion appears inhomogeneous or is suspected of having been subjected to freeze-thaw cycling prior to testing and a second, representative sample cannot be obtained, actual emulsion performance at time of construction should be reviewed. If sample integrity issues persist, consider deploying AASHTO PP 71-11, Standard Practice for Certifying Suppliers of Emulsified Asphalt, so that liquid emulsion samples are taken directly from heated storage tanks and are evaluated soon after cooling directly to the required test temperature."

We will include these comments in the re-ballot.

Comment and negative vote from: Washington State Department of Transportation (Kurt R Williams) (willikr@wsdot.wa.gov) - Negative

The notes on Page 2 of 1914 under FHWA Michael Voth: Proposed an alternative test method for labs that to not use trichloroethylene, but does not state nor propose deleting the solubility tests.

WSDOT currently uses the solubility tests and does not support eliminating this test procedure. The solubility tests needs to remain an option.

Response:

Trichloroethylene (TCE) is a highly toxic material. As an example, according to the EPA one small drop in an Olympic size swimming pool would render the water hazardous and lead to expensive mitigation. Labs have spent millions of dollars in clean-up costs for accidental spills. We do not believe that AASHTO should be promoting the use of TCE. Just as labs have moved away from using mercury thermometers, labs should move away from using TCE.

The original purpose of the solubility test was to identify inorganics. The ash test provides an easy and simple way to identify inorganics in the emulsion residue without having to deal with dangerous solvents. The ash test is considered an equivalent test procedure for identifying inorganic material and Michigan already has this in their specification in combination with solubility. Lab testing data with both solubility and ash test results are available to support this position.

The use of the solubility test also has been complicated by the introduction of polymers into the emulsions used for pavement preservation techniques. The decrease of the specification from 99% to 97.5% minimum was done to allow use of the polymers in those systems. The solubility test does not work well in its original intent as it has been shown to have issues with some polymer systems that perform well in the field. This is due to “gelling” or “swelling” due to the solvent preventing a passing result in those systems by clogging the screen. The failure is not due to inorganic materials, as originally proposed for this test. The ash test will solve this problem for these modified products. Alternative solvents also create these issues, even though they have less environmental impact than the trichloroethylene currently being used. Currently AASHTO specifications only allow trichloroethylene in their specifications.

The solubility test procedure, AASHTO T 44, is not being eliminated. It is still available for agencies to use and specify.

This is a recurring theme throughout M 140, M 208, and M 316. To clarify, the solubility test will still exist – it will just be taken out of M 140, M 208 and M 316. MS expressed concern about not specifying solubility information in these standards. Colin Franco suggested adding an informational note about solubility, i.e. T 44 could be performed, but burn-off would be the deciding test for the ash content/insolubility. There are concerns about using trichloroethylene. Appropriate language will be drafted for a Note. VA also suggested adding a note that the TCE test will be eliminated to give everyone a heads up and allow time for everyone to switch over to the ash test. WA agreed to withdraw their negative. NJ expressed concerns about getting different results depending on what is chemically in the asphalt. Comment was made that the purpose of the test is to measure inorganics. Suggestion to look at ASTM D7553 (solubility in n-Propyl bromide) as an option – that test is included in AMRL’s scope. The standards were written around the materials that were available at that time. Now we have incorporated modifiers. A task group (WA, ND, VA, MS?) will be formed to work on language.

Comment from Pennsylvania Department of Transportation (Robert D Horwhat)
(rhorwhat@pa.gov)

Note 1 needs edited to remove "cationic" after "polymer-modified" since the proposed changes to M 316 will include both anionic and cationic emulsions.

I don't agree with Section 3.1: "Upon receipt, inspect the emulsified asphalt to ensure that it has not been subjected to freeze-thaw conditions." Assuming the emulsion was separated, how would you determine if the emulsion had been subject to freeze-thaw conditions if it wasn't frozen or partially frozen at the time you were inspecting it?

It will be difficult for us to test emulsions within 14 days of the sampling date, especially samples obtained in the field. I prefer the 30 day time limit that is in the current version of M 140.

Why aren't the following emulsions include in Table 1?: HFMS-1, HFMS-2, HFMS-2h, HFMS-2s, and QS-1h?

HFRS-2 is listed twice in Table 1 in both the Medium Setting and Rapid Setting sections.

Why is HFRS-2, HFRS-2h, and HFRS-2s in the Medium Setting section of Table 1?

Footnote "b" should also be listed after Distillation: Residue, % in Table 1.

(SME respondent: Troy Lehigh): They have not provided enough background information to explain why they have chosen to replace the Solubility Test with the Ash test. There are other potential solvents that can replace Trichloroethylene, such as N-Propyl Bromide.

They have not provided enough background information to explain why the Coating Tests were deleted.

They have not given enough background information to explain why the Targets and Ranges for viscosity, percent residue, and penetration were changed.

Response:

Regarding comment on note 1, that is a typo and will be corrected.

Regarding comment on Section 3.1, it is agreed that better clarification is warranted regarding inspecting for freeze – thaw conditions during sample transit. See the re-wording recommendation in the response to the Mississippi DOT's comment on Section 3.1.

The comment about the difficulty of State DOT labs to complete testing within 14 days is real and understood, but the time requirement for testing was put in place due to technical reasons. The emulsion should be tested as soon as possible after sampling. The longer an emulsion is stored, even in a sealed container, the more likely the results of the emulsion liquid properties such as viscosity will be invalid. Additionally, with the fast pace of construction operations, it is in the best interest of the agency to get feedback on conformance to specifications sooner rather than later. NCHRP 14-17 (which led to the publication of the AASHTO Manual for Emulsion-Based Chip Seals for Pavement Preservation) indicated that the viscosity of the emulsion during construction is an important factor and it should be evaluated as soon as possible, preferably in the field during construction. Agencies that find the 14 day testing window too difficult to meet, may want to consider deploying AASHTO PP 71-11, Standard Practice for Certifying Suppliers of Emulsified Asphalt. Regardless of the time requirement that is eventually included, it should be consistent between M 140, M 208, and M 316. Currently, the time requirements are confusing and inconsistent as shown in the following:

M 140 - requires testing within 30 days for demulsibility. Also requires, within 30 days, that emulsion is homogeneous after thorough mixing but presumably there is no time limit for completing other testing.

M 208 – Within 14 days, requires emulsion to be homogeneous after thorough mixing but presumably there is no time limit for completing other testing.

M 316 - requires all testing to be completed within 30 days.

ASTM D977 - requires all testing to be completed within 14 days.

Discussion. James Williams commented that for a best practice type of standard, the shorter time frame is better. TX DOT agreed, with comment. LA agreed with TX and likes to test everything as quickly as possible. VA also agreed, suggested keeping it as 14 days and adding a note about how quickly the emulsion breaks (within the first few days) and residue can be tested later. Appropriate language will be developed for addition to the standard and inclusion in the ballot.

Regarding comment about the grades of emulsion included in table 1, HFMS-2, HFMS-2h, HFMS-2s were supposed to be included but were left out due to typographical error when the ballot was being prepared. QS-1h and HFMS-1 were not included due to lack of use. However, these two emulsions could easily be inserted in the future if requested. The comments about rapid set emulsions in the medium set table are again typographical errors and they will be corrected.

Regarding the comment about footnote “b”, the issue is not the validity of the test but rather the appropriate residue target for diluted emulsions. The will be corrected by adding a footnote “d” (listed after Residue, % in Table 1) and stating “For emulsions that are diluted, the percent residue requirements must be adjusted accordingly.”

Regarding the comment about replacing the solubility test with the ash test, please refer to the response to the comment above from the Washington DOT (TCE is a highly toxic substance and it’s best to avoid its use). It is correct that N-propyl bromide is a much safer solvent to use, but the ETF has substantial test data to show the ash test is a suitable replacement. Additionally, there is concern that N-propyl bromide, toluene, or any solvent material will cause gelling/swelling in modified emulsions and lead to failing results. The ash test is a well-established test, easy to perform, and it successfully identifies inorganic materials in the residue.

Regarding the comment about the coating test, it is important to note the test was not deleted. It still remains in AASHTO T 59. It was not included in the emulsion specifications because it is a mix design related test – not a liquid emulsion test. The coating test would be appropriate to include in a mix design standard.

Regarding the comment about why residue and viscosity targets and ranges were changed; there was a desire to have values that were normalized and consistent. Minimum residue percentage requirements were consolidated to 65% for chip seal emulsified asphalt products for consistency purposes. There was not a technical reason for some products to have a 63% minimum residue and for others to have a 65% minimum residue. Viscosity range requirements were consolidated to 100 – 400 SFS for chip seal emulsified asphalt products for consistency purposes. There was not a technical reason for some products to have 75 SFS minimums or 450 SFS maximums versus the more universal 100 – 400 SFS range.

Regarding penetration values changes, hard (h) and soft(s) grades were added to the RS-1 and RS-2 grades (as well as CRS-1, CRS-2, and CRS-2P grades). Agencies with chip seal projects in very hot climates or high traffic conditions have adjusted their specifications to apply a harder material. Conversely, in colder climates or late season chip sealing, agencies have adjusted specifications to apply a softer material. A study completed by FHWA reviewed State DOT specifications for Pen grades and made recommendations for Pen ranges based on climate and other information. The

updated Pen values capture common State DOT practices and allow these specifications to be useable by more states. As a result, consistent, logical, and gap-less Pen grades are established across M 140, M 208, and M 316.

We expect the proposed changes to promote more uniformity of standards from state to state and thus lower costs to state DOTs from the efficiencies gained.

Pennsylvania was not on the line.

ii) M 208 Cationic Emulsified Asphalt, 42-Yes, 4-No, 7-No vote

Comment and negative vote from Georgia Department of Transportation (Charles Allen Hasty) (chasty@dot.ga.gov) – Negative (Georgia had 2 negative votes on record)

The test for solubility in TCE is being replaced with Ash content. However, the ash content test does not deter other materials than mineral materials. For example, rubber is not soluble in TCE but can be burned with little ash in ignition over. Keep Solubility test.

Response:

Trichloroethylene (TCE) is a highly toxic material. As an example, according to the EPA one small drop in an Olympic size swimming pool would render the water hazardous and lead to expensive mitigation. Labs have spent millions of dollars in clean-up costs for accidental spills. We do not believe that AASHTO should be promoting the use of TCE. Just as labs have moved away from using mercury thermometers, labs should move away from using TCE.

The original purpose of the solubility test was to identify inorganics (not rubber or other polymers). The ash test provides an easy and simple way to identify inorganics in the emulsion residue without having to deal with dangerous solvents. The ash test is considered an equivalent test procedure for identifying inorganic material and Michigan already has this in their specification in combination with solubility. Lab testing data with both solubility and ash test results are available to support this position.

The use of the solubility test also has been complicated by the introduction of polymers into the emulsions used for pavement preservation techniques. The decrease of the specification from 99% to 97.5% minimum was done to allow use of the polymers in those systems. The solubility test does not work well in its original intent as it has been shown to have issues with some polymer systems that perform well in the field. This is due to “gelling” or “swelling” due to the solvent preventing a passing result in those systems by clogging the screen. The failure is not due to inorganic materials, as originally proposed for this test. The ash test will solve this problem for these modified products. Alternative solvents also create these issues, even though they have less environmental impact than the trichloroethylene currently being used. Currently AASHTO specifications only allow trichloroethylene in their specifications.

The concern mentioned about rubber appears to be more related to asphalt binders and not emulsified asphalt. It is important to note that the solubility test procedure, AASHTO T 44, is not being eliminated. It is still available for agencies to use and specify.

Comment from Mississippi Department of Transportation (James A. Williams) (jwilliams@mdot.state.ms.us)

Section 3.1 - The title of this section, "Requirements," indicates that the paragraphs should support and/or explain the requirements for the emulsified asphalt. The way Section 3.1 is worded it relates more to the visual inspection, sampling, and the requirement to test the material within 14-days of the

sample date. The information related to sampling should be moved to Section 4. The second sentence related to the appearance of the emulsion after thorough mixing could stay in Section 3.1. It is also recommended that a Note be added as information related to storage stability. Following is recommended wording of Section 3.1 and the note:

"Emulsified asphalt consists of base asphalt binder, water, and emulsifying agents. After thorough mixing, the emulsified asphalt should appear to be homogeneous. Upon receipt, the emulsified asphalt should be visually inspected to ensure that it has not been subject to freeze-thaw conditions and to assure that the emulsion has not separated during storage and shipping."

Note 1: Separation of emulsified asphalt can cause the material to be difficult to apply. Separation may result in an increase or decrease in the residual binder rate after application which can result in poor performance. Additionally, dilution of the emulsified asphalt to aid in the application of the material should not occur without approval of the buyer.

Section 4 - It is recommended that a Section 4.3 be added stating the following:
"Samples of emulsified asphalt shall be tested within 14 days of the sample date."

Response:

These are the same comments made on M 140. Please refer to our response above.

Comment and negative vote from: Washington State Department of Transportation (Kurt R Williams) (willikr@wsdot.wa.gov) - Negative

The notes on Page 2 of 1914 under FHWA Michael Voth: Proposed an alternative test method for labs that to not use trichloroethylene, but does not state nor propose deleting the solubility tests.

WSDOT currently uses the solubility tests and does not support eliminating this test procedure. The solubility tests needs to remain an option.

Response:

These are the same comments made on M 140. Please refer to our response above.

Comment and negative vote from Ohio Department of Transportation (Lisa Zigmund) (lisa.zigmund@dot.state.oh.us) - Negative

Newly added 14 days to test. This time restriction puts us at a disadvantage with suppliers in disputes. As a state agency doing more with less this is impossible to meet every time. Samples are taken from projects and then change hands thru the project office, then the DOT district offices(project to district materials lab to district transportation) for transportation (twice per week) to the DOT emulsion test lab in the DOT main office. Then the sample is placed in queue for testing. We have not had issue with catatonics generally. Suppliers can formulate for chemical stability. Suggest as compromise 21 days.

Response:

The difficulty of State DOT labs to complete testing within 14 days is real and understood, but the suggested time requirement for testing was put in place due to technical reasons. The emulsion should be tested as soon as possible after sampling. The longer an emulsion is stored, even in a sealed container, the more likely the results of the emulsion liquid properties such as viscosity will be invalid. Additionally, with the fast pace of construction operations, it is in the best interest of the agency to get feedback on conformance to specifications sooner rather than later. NCHRP 14-17 (which led to the publication of the AASHTO Manual for Emulsion-Based Chip Seals for Pavement Preservation) indicated that the viscosity of the emulsion during construction is an important factor and it should be evaluated as soon as possible, preferably in the field during construction. Agencies that find the 14 day testing window too difficult to meet, may want to consider deploying AASHTO PP

71-11, *Standard Practice for Certifying Suppliers of Emulsified Asphalt*. Regardless of the time requirement that is eventually included (14 days, 21 days, etc.); it should be consistent between M 140, M 208, and M 316. Currently, the time requirements are confusing and inconsistent as demonstrated below:

M 140 - requires testing within 30 days for demulsibility. Also requires, within 30 days, that emulsion is homogeneous after thorough mixing but presumably there is no time limit for completing other testing.

M 208 – Within 14 days, requires emulsion to be homogeneous after thorough mixing but presumably there is no time limit for completing other testing.

M 316 - requires all testing to be completed within 30 days.

ASTM D977 - requires all testing to be completed within 14 days.

Comment from Pennsylvania Department of Transportation (Robert D Horwhat) (rhorwhat@pa.gov)

Affirmative, but please address the following:

I don't agree with Section 3.1: "Upon receipt, inspect the emulsified asphalt to ensure that it has not been subjected to freeze-thaw conditions." Assuming the emulsion was separated, how would you determine if the emulsion had been subject to freeze-thaw conditions if it wasn't frozen or partially frozen at the time you were inspecting it?

Footnote "b" should also be listed after Distillation: Residue, % in Table 1.

They have not provided enough background information to explain why they have chosen to replace the Solubility Test with the Ash test. There are other potential solvents that can replace Trichloroethylene, such as N-Propyl Bromide.

They have not provided enough background information to explain why the Coating Tests were deleted.

They have not given enough background information to explain why the Targets and Ranges for viscosity, percent residue, and penetration were changed.

Response:

These are the same comments made on M 140. Please refer to our response above.

**iii) M 316 Polymer-Modified Emulsified Asphalt, 39-Yes, 7-No, 7-No vote
Editorial comments included as appropriate. Other comments below:**

Comment from Tennessee Department of Transportation (Brian Egan) (brian.egan@state.tn.us)

Since nearly all modified emulsions need to be distilled at lower temperatures, should the Distillation temperature be stated for the materials listed if other than 500 degrees F (TP 59)?

Response:

This would be a good clarification. We suggest adding a footnote to the tables indicating that Section 6.4.5 of AASHTO T 59 be referenced for alternative temperature requirements for polymer modified samples. We suggest that Section 6.4.5 of T 59 be modified to have following temperature requirement for polymer modified samples: 350°F for 20 minutes.

Comment and negative vote from Virginia Department of Transportation (Charles A. Babish)
(andy.babish@vdot.virginia.gov) - Negative

The changes to M316 Tables 1, 2 and 3 do not allow the evaporation method to be used to obtain the asphalt residue for testing. Virginia believes M316 should allow either the distillation or evaporation procedure in T-59 to be used to obtain the asphalt residue for testing. Allowing only AASHTO T-59 residue by distillation on a polymer modified emulsion may cause polymers to separate and clump during high temperature heating. Our experience in testing polymer modified emulsions is that once a polymer has been heated to this point some separation of polymer occurs, stirring the residue will not result in a homogenous material. According to Section 5.4.7 of AASHTO T-59 the residue shall then be poured through a No. 50 sieve. By sieving this material polymers will be separated from the residue that is to be tested causing results that may not be representative of the material that has been submitted. If the material is not poured over a No. 50 sieve then clumps will be left in the residue. Tests such as a penetration may not be representative of polymer asphalt. If a penetration is performed on an area containing a clump of polymers that result will be different from an area that may not contain a clump of polymers. Virginia would like to continue to use Residue by Evaporation according to AASHTO T59 for testing emulsions that contain polymers.

Response:

We find this comment persuasive and suggest that the specification allow for either the distillation or evaporation procedure of T 59, but a note will be added indicating that both the agency and supplier should use the same procedure to assure comparable results. As indicated in T 59, properties of the residue from the evaporation procedure may differ from those from the distillation residue.

The current version of M 316 allows the residue by evaporation method so this should be considered an editorial.

Comment and negative vote from Georgia Department of Transportation (Charles Allen Hasty)
(chasty@dot.ga.gov) – Negative (Georgia has 2 negative votes on record)

The test for solubility in TCE is being replaced with Ash content. However, the ash content test does not deter other materials than mineral materials. For example, rubber is not soluble in TCE but can be burned with little ash in ignition oven. Keep Solubility test.

Response:

This is the same comment from M 208. Please refer to our response above.

Comment and negative vote from Texas Department of Transportation (Darren Hazlett)
(darren.hazlett@txdot.gov) - Negative

I think having a grade named HFMS as a rapid setting emulsion is confusing, but even more so is the inclusion of two decidedly different versions of CQS-1hP. If we were using this, we would not be able to work with a grade name that doesn't always mean the same thing.

Response:

The use of the grade CQS-1hP in Table 3 is a typographical error. The grade should be CRS-1P and it will be changed. We also find the comment about the medium setting emulsion persuasive and will add a heading for “medium setting”.

Comment from Mississippi Department of Transportation (James A. Williams)
(jwilliams@mdot.state.ms.us)

Section 3.1 - The title of this section, "Requirements," indicates that the paragraphs should support and/or explain the requirements for the emulsified asphalt. The way Section 3.1 is worded, it relates more to the visual inspection, sampling, and the requirement to test the material within 14-days of the sample date. The information related to sampling should be moved to Section 4. The second sentence related to the appearance of the emulsion after thorough mixing could stay in Section 3.1. It is also recommended that a Note be added as information related to storage stability. Following is recommended wording of Section 3.1 and the note:

"Emulsified asphalt consists of base asphalt binder, water, and emulsifying agents. After thorough mixing, the emulsified asphalt should appear to be homogeneous. Upon receipt, the emulsified asphalt should be visually inspected to ensure that it has not been subject to freeze-thaw conditions and to assure that the emulsion has not separated during storage and shipping."

Response:

These are the similar comments made on M 140 and M208. Please refer to our response above.

Comment and negative vote from Washington State Department of Transportation (Kurt R Williams)
(wiliokr@wsdot.wa.gov) - Negative

WSDOT currently uses the solubility tests and does not support eliminating this test procedure. The solubility needs to remain an option.

Also not in support of changing the temperature specification for elastic recovery that is proposed to change from 25 Deg C to 10 Deg C. Also AASHTO T 301 notes unless otherwise specified the elastic recovery tests temperature is 25 Deg C. WSDOT runs the elastic recovery test at 25 Deg C.

Response:

Regarding the concern about the solubility test, this is the same comment from M 140 and M 208. Please refer to our previous response.

Regarding the temperature specification for elastic recovery, the "Elastic Recovery in a Ductilometer" test was borrowed from a German standard developed in the early '80s. The original German test method specified 10°C as the test temperature, largely because results reflect a more brittle range where the binder is susceptible to fatigue/fracture.

Numerous AASHTO agencies elected to change the test temperature to 25°C, usually because their ductilometers tested HMA binder specimens at this temperature and their existing equipment did not have chillers. At the colder 10°C test temperature, meeting the 20 cm ductility (at 5 cm/min pull rate) can be as important as satisfying the elastic recovery requirement. Recoveries are typically higher at the lower test temperature. There is significant variability between state DOT's with requirements for test temperature. Numerous states are using 10°C, but there are numerous states using 25°C. There are a few states that use 4°C and a few states that specify multiple temperatures depending upon the emulsion grade/type.

It is recommended to use 10°C for the ER test temperature. 10°C provides a good compromise for performance specifications that include both SBS and SBR modification in a single grade format. Many specifications from the past differentiated SBS and SBR modified emulsions as separate materials. SBS specifications often used force ductility ratio, and SBR specifications usually had very high ductility requirements at low temperatures. Based on the SBS block copolymer micro- and macrostructure, a stress peak at higher elongation is noted in the force ductility trace of the SBS

polymer-modified residue. This same secondary peak is generally not noted in SBR latex polymer-modified residues. Conversely, based on the random polymer microstructure, correspondingly low, single glass transition temperature, and high and multi-disperse molecular weight, SBR latex polymer-modified residues will generally show much superior performance in ductility testing at low test temperatures (40C) when compared with SBS polymer-modified residue.

Although the force ductility ratio and ductility are valid tests for their respective polymer systems, neither of these two options is a fair compromise if a single polymer-modified emulsion specification is to be open to both polymer types.

WA spoke about this. They don't have any data to draw from for 10C. It also requires a change in the temperature of the water bath, which may be problematic for other labs. Various states chimed in regarding the temperatures they use for binders vs. emulsions (4C, 10C, 25C). Few labs are using 25C, many use 10C, although one state indicated that some PG binders are performed at 25C. Thus, there is difficulty in requiring one temperature. Discussion that states should choose temperatures that work in the area/climate. Seems like some states have already developed their own targets. Might be best to leave it as 25C. Will work on alternate language for next TS ballot.

Comment and negative from Ohio Department of Transportation (Lisa Zigmund) (lisa.zigmund@dot.state.oh.us) - Negative

Revise 30 to 14 days. Same reasons as above for negative vote.

Response:

This is the same comment from M 208. Please refer to our previous response.

Comment and negative vote from Arkansas State Highway and Transportation Department (Michael C Benson) (michael.benson@arkansashighways.com) - Negative

Arkansas specifications differentiate between products modified with styrene butadiene or styrene butadiene styrene block copolymer (CRS-2P) and those modified with styrene butadiene rubber latex or polychloroprene latex (CRS-2L). The definitions in Section 3 are used as part of the criteria along with the performance on ductility at 4°C, the force ratio (where specified), and the polymer content. Supporting documentation for the removal of the current specified parameters need to be provided to allow for review. Additionally, the impact of changes to the elastic recovery test temperature was not provided along with the changes to the properties on a distillation residue rather than an evaporation residue.

Response:

There is a strong agency and industry desire to make the specification neutral/generic to the type of modifier being used. Suppliers of the various modifiers are in agreement with the proposed specification. Good performance with both latex and SB/SBS modifiers is well documented over the past decade and it's believed that now is an appropriate time for the specification to have a generic and neutral approach.

Regarding the temperature specification for elastic recovery, the "Elastic Recovery in a Ductilometer" test was borrowed from a German standard developed in the early '80s. The original German test method specified 10°C as the test temperature, largely because results reflect a more brittle range where the binder is susceptible to fatigue/fracture.

Numerous AASHTO agencies elected to change the test temperature to 25°C, usually because their ductilometers tested HMA binder specimens at this temperature and their existing equipment did not have chillers. At the colder 10°C test temperature, meeting the 20 cm ductility (at 5 cm/min pull rate) can be as important as satisfying the elastic recovery requirement. Recoveries are typically

higher at the lower test temperature. There is significant variability between state DOT's with requirements for test temperature. Numerous states are using 10°C, but there are numerous states using 25°C. There are a few states that use 4°C and a few states that specify multiple temperatures depending upon the emulsion grade/type.

It is recommended to use 10°C for the ER test temperature. 10°C provides a good compromise for performance specifications that include both SBS and SBR modification in a single grade format. Many specifications from the past differentiated SBS and SBR modified emulsions as separate materials. SBS specifications often used force ductility ratio, and SBR specifications usually had very high ductility requirements at low temperatures. Based on the SBS block copolymer micro- and macrostructure, a stress peak at higher elongation is noted in the force ductility trace of the SBS polymer-modified residue. This same secondary peak is generally not noted in SBR latex polymer-modified residues. Conversely, based on the random polymer microstructure, correspondingly low, single glass transition temperature, and high and multi-disperse molecular weight, SBR latex polymer-modified residues will generally show much superior performance in ductility testing at low test temperatures (40C) when compared with SBS polymer-modified residue.

Although the force ductility ratio and ductility are valid tests for their respective polymer systems, neither of these two options is a fair compromise if a single polymer-modified emulsion specification is to be open to both polymer types.

Regarding use of distillation residue rather than evaporation residue, we agreed with the comment from the Virginia DOT and propose that residue by evaporation be retained as an option.

Comment from Pennsylvania Department of Transportation (Robert D Horwhat) (rhorwhat@pa.gov)

Affirmative, but please address the following:

In the discussion notes it says "References to T 51 (ductility), T 300 (force ductility), and T 302 (polymer content by infrared spectrum) are deleted because polymer dosage can be evaluated with the elastic recovery test (T 301). In the proposed version, those tests have not been deleted from the Referenced Documents Section. Should they be included or not?"

In Section 3.1, I prefer the 30 day time limit that is in the current version of M 316. It is difficult for us to complete the testing in within 14 days due to shipping time.

Footnote "b" should also be listed after Distillation: Residue, % in Table 1.

They have not provided enough background information to explain why they have chosen to replace the Solubility Test with the Ash test. There are other potential solvents that can replace Trichloroethylene, such as N-Propyl Bromide.

There isn't a CHFRS-2 in M 208, why is there a CHFRS-2P in M 316?

HFMS-2P is listed under the Rapid Setting section of Table 1. It is a medium-setting emulsion.

Response:

The editorial comments about T 51, T 300, and T 302 are correct. The methods will be deleted.

The 14 day testing requirement, footnote b concern, and the replacement of the solubility test comments are the same as in M 140 and M 208. Please refer to our previous responses.

Regarding why there is not a CHFRS-2P grade in M 316, no one is aware of this grade being produced and used. It can always be added in the future if it becomes available.

A "medium setting" heading will be added above the HFMS-2P in Table 1.

iv) T 78 Distillation of Cutback Asphalt Products, 46-Yes, 0-No, 7-No vote

Arkansas State Highway and Transportation Department (Michael C Benson)
(michael.benson@arkansashighw

In Section 5.5 the dimensions of two sheets of wire gauze 15 cm² (2.3 in.²) are indicated supported on a tripod or ring over a chimney for the burner. This wire gauze on the tripod or ring supports a shield with an opening of 117 mm (4.6 in.) diameter. The dimension for the wire gauze is not sufficient. It appears that the intent was to have a wire gauze sheet 15 cm square or 15 cm x 15 cm not 15 cm². Use of a 12.7 cm square sheet (5 in. square) has been found to be sufficient.

In Section 9.1. the calculation for asphalt residue content is missing a parenthesis. It should read $R = [(200 - TD)/200] \times 100$

Response:

The dimension of the wire gauze are incorrect and will be corrected.

Section 9.1 equation will be corrected.

This will be corrected.

v) T 302 Polymer Content of Polymer-Modified Asphalt Residue and Asphalt Binders

(a) 45-Yes, 0-No, 8-No vote [A comment was removed about using experienced testers.](#)

vi) TP 91 Determining Asphalt Binder Bond Strength by means of the Binder Bond Strength (BBS) Test, 46-Yes, 0-No, 7-no vote

Numerous editorial comments were received and incorporated as appropriate.

Section 9.2 " Composite Substrates. There seems to be much left for interpretation on how composite substrates should be fabricated.

Isn't there a concern that a composite substrate could be fabricated that has too much percent area of cement compound and not enough aggregate? Or could there be an optional adjustment to the calculation in 11.8 based on how much area is aggregate and how much is cement compound?

The "rapid-setting cement compound" isn't defined in Section 6.

Why must composite substrates be casted in concrete cylinder molds (is the size specified standard 152 mm (5.98 in) diameter and 354 mm (13.94 in) in height. the correct size), so long as they are cut to dimensions meeting the requirements listed in 9.3?

[This comment was sent in from the emulsion task force. Discussion. May be better to remove the inclusion of composite substrates.](#)

vii) T 59 Emulsified Asphalt, 43-Yes, 3-No, 7-No vote [Suggestion made by Brian Johnson/AMRL to break T 59 up into separate tests so that it is easier to ballot and make changes. This will be discussed at the SOM meeting in Pittsburgh.](#)

Editorial comments included.

Washington State Department of Transportation (Kurt R Williams) (willikr@wsdot.wa.gov) – Negative
(Table 2) The proposed change requires a 0.4 gram difference in correction factors for the 2 test temperatures (500F & 350F). The 0.4 gram difference results in a 0.2% change in the final result. The multi-lab precision is 2.0%, additionally the results are reported to a whole number. To add an additional correction factor only complicates the process with negligible results.

Response:

T59 has always corrected for this known error- the 1.5g “correction factor” was noted as due to the effect of temperature on the weight of the still – the additional factors are just due to differing temperatures used for polymer modified emulsions. (Previous Note 5= Note 11 now)

Discussion. The 1.5 g correction factor has always been in the standard. It’s a known error. Rocky Mountain group will be contacted again to determine the best way to handle this.

Ohio Department of Transportation (Lisa Zigmund) (lisa.zigmund@dot.state.oh.us) - Negative

A platinum resistance thermometer (PRT) meeting ASTM E1137 is very hard to find. Where do you buy them? We have not had success. In addition PRTs are delicate (not Durable) and of high accuracy not needed for most specifications. (This section requires liquid thermometer of max. error of 1.0C. We have found good quality RTD resistance temperature detectors such as OMEGA TJ36-CPSS-18U-18-SMPW along with a Fluke reader performs well, are of suitable accuracy in specified temperature ranges (0.3C), are stable and are durable. Since a calibration and correction is performed why does the PRT need to be the only option?

We suggest adding another non-liquid option of RTD devices of suitable range, accuracy and reliability

Response:

PRT is an option. Ohio will propose another option for a digital thermometer.

Georgene spoke about this. It was an attempt to add another thermometer. Will set up a call with Maria Knake of AMRL to discuss thermometers. OH would like to discuss this further. PRT may not be the best option but it’s not a simple matter. OH has agreed to withdraw the negative.

Nevada Department of Transportation (Reid G Kaiser) (rkaiser@dot.state.nv.us) - Negative

- a. Subsection 4.3.1 Table 1 – I believe the requirement heating 77°F viscosity emulsions to a minimum temperature of 70°F is unnecessary and time consuming.
- b. Subsection 4.4.2 – I believe the requirement for stirring the emulsions periodically while heating is unnecessary and time consuming.
- c. Subsection 4.4.4 - I believe the requirement heating 77°F viscosity emulsions to a minimum temperature of 70°F is unnecessary and time consuming.
- d. Subsection 8.4.1 – Subsection 4.4.2 required heating the emulsions in an oven or water bath. However, Subsection 8.4.1 states to heat the emulsion in a water bath. This is a discrepancy that needs to be addressed. There is no reason to limit the heating to a water bath and not an oven.
- e. Subsection 9.6.2 – This increases the temperature tolerance on the emulsion to be tested from $50 \pm 0.05^{\circ}\text{C}$ ($122 \pm 0.1^{\circ}\text{F}$) to $50 \pm 0.3^{\circ}\text{C}$ ($122 \pm 0.5^{\circ}\text{F}$). Why the increase? The existing tolerances have existed for years. There is no problem obtaining these temperature tolerances, and therefore no reason to increase them. This increase could lead to increased testing variability and repeatability, incorrectly passing or failing a sample, and insufficient temperature stability.

Response:

a. and c. 4.3.1 – Nevada has agreed to withdraw

*b. Section 4.4.2: Section 4.42 will be modified on a future ballot to make stirring requirement optional in a note **Stirring requirement will be put in a Note. It won’t be made mandatory.***

- d. New business. Will be added to a future ballot
- e. Section 9.6.2: T 59 –This change was presented by the RMAUPG and AMRL representatives. To be discussed [Discussion](#).

Kentucky Transportation Cabinet (Allen H Myers) (allen.myers@ky.gov)

In Section 6.3.4.1, an ASTM 7C thermometer cannot check the ice point because it only goes down to 40°F.

Response:

ASTM E 1 notes 7c has a range to 30F

Tennessee Department of Transportation (Brian Egan) (brian.egan@state.tn.us)

Now that Table 1 has been added to summarize 4.4.2 through 4.4.5, the language in sections 4.4.2 to 4.4.5 doesn't seem necessary.

Response:

Will remove 4.4.2 to 4.4.5. Add new section 4.4.2 on future ballot that notes: Add "Stir sample before testing." Note 1 and 2 will remain.

North Carolina Department of Transportation (Christopher A Peoples) (cpeoples@ncdot.gov)

1) Subsection 7.4.2: rewrite first sentence: "When tests on the residue from the emulsified asphalt are required, replace place the beakers in the oven..."

2) Subsection 17.3.6: delete phrase from end of 2nd sentence: "The thermometer must be standardized in accordance with one of the methods in ASTM E 77 or ASTM E 644. depending on the type of thermometer it is."

Response:

- 1. editorial
- 2. editorial

Rhode Island Department of Transportation (Mark E Felag) (mark.felag@dot.ri.gov)

Page 68 - 8.4.1 - Is there a minimum water temperature? Possibly change requirement to 74 +0/-3 or something similar.

Page 72 - 9.3.11.1 and .2 - This should be worded the same for consistency

Response:

Section 8.4.1 – A minimum is not needed unless there would be a time restriction. Tolerance not needed since it is not exact and now states 'not to exceed 74°F)

Section 9.3.11.2 & 2- This will be changed editorially.

Arkansas State Highway and Transportation Department (Michael C Benson) (michael.benson@arkansashighways.com)

The interpretation of the thermometer temperature range given in Table 1 could be misread to allow for thermometers with only the indicated range where any thermometer encompassing the indicated range would be appropriate.

Response:

Will editorially add "Minimum" to "Thermometer Temperature Range" in Table 1

Section 4.4.2 indicates that the sample should be heated to 50°C (122°F) while the documentation in Section 4.4.3. for the same material (viscosity requirements at 50°C (122°F)) indicates cooling to the appropriate conditioning temperature specified in the test method. Is this to be interpreted as 50°C (122°F) or as governed by the individual section. Unfortunately, few of the methods list a beginning temperature. It has been the Department's interpretation that when none is listed, such as in Section 5, 6, 7, 10, 11, 14, 16, 18, etc. it is conditioned to the required viscosity grade temperature prior to testing. Table 1 presents additional confusion with indication to "heat sample to a least 50°C (122°F).

Similar issue in Sections 4.4.4. and 4.4.5. as stated in previous comment.

Response:

The result of Table 1 and Section 4 are for conditioning the sample by getting it at least to the required viscosity temperature of 77 or 122 F (either by heating or cooling) before testing. If it comes in hotter it is already past the minimum temperature. This will be clearer with the removal of 4.4.2 – 4.4.5.

Listed conditioning temperature for 50°C (122°F) material needs an allowable tolerance as many test methods in the body of the document do not state. Current specification has allowed 50 ± 3°C (122 ± 5°F).

Response:

See note above related to Table 1 and Section 4 –it as a minimum temperature so it does not really need a tolerance.

Verbiage in section 6.3.1 indicates that dimensions are approximate. The drawing in Figure 2 appears to indicate a thickness of 3.2 mm for the upper flange on the still. The upper flanges on the Department's stills are 8 mm in thickness. Clarification that the drawing dimensions are approximate or allowable tolerances would be appropriate.

Response:

Editorial

The depth of immersion of the thermometers/probes in Section 6.3.4. is more procedural than equipment specification and addressed partly in Section 6.4.3. Recommend removal of the last two sentences in Section 6.3.4 with placement of the last sentence in Section 6.4.3.

Response:

Suggest change wording in 6.3.4 to "The thermometers shall be constructed such that they can be positioned in the manner noted in Section 6.4.3.", since that is an equipment spec issue.. This will be addressed on a future ballot.

In Section 6.4.5. allowing "alternative distillation temperature ranges as specified by the manufacture" removes control from the purchaser. The choice for allowances for different distillation temperatures should be the purchaser's.

Response:

Potential wording change in 6.4.5. to: "Alternative distillation temperature ranges specified by the manufacturer ~~shall~~ should be used when testing polymer -modified samples, but this shall be approved by the purchaser." This will be included on a future ballot.

While allowing to quickly immerse the bottom of the still in a pan of cold water in Note 10 should be allowed but safer methods should as removal of heat would also be appropriate. Recommend alternative verbiage, "Quickly remove the heat, immersion the bottom of the still in a pan of cold water, or other appropriate means until foaming ceases."

Response:

Potential wording change: "Quickly remove the heat from the pot by immersion in a pan of cold water, or other appropriate means, until foaming ceases."

Section 7 requires the determination of residue in four beakers. This is overkill. The determination of residue on two of four beakers would be sufficient. Multiple beakers will be required for sufficient residue testing; however, two beakers should provide sufficient for percent residue.

Response:

Averaging four tests is not new, just the Section number changed- New Business will need to be balloted next year.

Note 12 indicates care needed if sample foams or spatters. The word "Also" at the beginning of the second sentence should be removed as it appears the only resolution to foaming or spattering is to bring the oven and samples to temperature together. It is assumed that timing for the initial 2 h would begin once the oven and sample are set at $163 \pm 3^{\circ}\text{C}$ ($325 \pm 5^{\circ}\text{F}$).

Response:

Editorial change.

The filter in Section 9.3.10. should be defined as having 0.850-mm openings. As written, any size would be allowed.

Response:

This change was made to allow the option to not filter the material at this point of the test as had been requested on a prior ballot.

Section 9.6.2 states that the temperature of the heating of the 100 mL sample should be $51.4 \pm 0.3^{\circ}\text{C}$ ($124.5 \pm 0.5^{\circ}\text{F}$). Recommend temperature limit be left as stated in current specification "Heat the emulsified asphalt in the water bath to a temperature not greater than 53°C (127.4°F).". This temperature allowed for sufficient heat retention when filtering is performed from the sample transfer container to the viscometer tube, which is still allowed by Note 20.

Response:

Section 4 is a minimum conditioning temperature, not a range. Unless there is research showing that this particular test needs the sample to be poured at $124.5 \pm 0.5^{\circ}\text{F}$ the 'not greater than 127.4°F wording' should remain, because the test itself does have a range of temperature.

In Section 10.3.5. and 10.3.6. it would be appropriate to use the normality(N) of the calcium chloride solutions in the main reference rather than the concentration in g/L as the normality(N) is what is referenced in the corresponding specifications (M 140 and M 316).

Response:

Not new wording, just the Section number changed- this is editorial.

Allowance for determination of the percentage of residue by evaporation in Section 10.4.1. and 10.5.1. would be appropriate.

Response:

Not new wording, just the Section number changed- this is New Business and would need to be balloted next year.

In Section 10.4.3 if the sample is conditioned to 50°C (122°F) as directed in Section, it would be inappropriate to "Heat the sample and proper reagent.....to 25 ± 0.5°C (77 ± 1.0°F). Modification to "Bring the sample" would resolve issue.

Response:

Section 10.4.3 is not new wording, just the Section number changed

Section 10.4.3. and other areas reference the requirement of three beaker assemblies to be ran per emulsified asphalt. It is requested that this quantity be reduced. The practicality is that this test is usually ran a single time due to the difficulty in kneading the material.

Response:

3 beaker assemblies is not new, just the Section number changed. Would be New Business and need to be balloted next year.

In Section 10.4.5. it indicates that the CaCl₂ solution should be added per Section 10.4.4.3, but 10.4.4.3. references the dioctyl sodium sulfosuccinate solution. Recommend removal of CaCl₂ reference.

Response:

Editorial, remove CaCl₂ reference

The reference in Section 12.3.7.1 to the T 153 fineness would be more appropriately expressed in m²/kg as expressed in the specification and test method.

Response:

Editorial

The temperature requirements in Section 13.4.1 appear to be very similar to the conditioning requirements in Section 4.

Response:

Editorial

First sentence in Section 13.4.2. needs to be divided into two statements, "Record the mass of the sieve and pan. Wet the wire cloth portion of the sieve with distilled water."

Response:

Editorial.

The reference to Note 24 is misplaced following Section 18.4.1. It appears that the error is due to the fact that the note reference in the previous edition was incorrect. Recommend removal of Note 24 reference OR removal of Note 30 with reference to Note 22.

Response:

Note 22 is the same as Note 30, reference in 18.4.1 to Note 24 to be removed- editorial

Note 24 should be placed following Section 18.5.2.

Response:

Editorial

Last reference in Section 18.5.3. of 18.5.2. is incorrect – should reference Section 7 with the average of the two beakers instead of four as required by Section 7. (Changing Section 7 to require the average of two beakers as requested earlier would resolve.)

Response:

18.5.2 is correct, this is testing the bottom and top portion of the sample as noted in Section 10.5

Reference in Section 27.8.1 to Note 33 is incorrect.

Response:

Editorial - should be Note 34

Oklahoma Department of Transportation (Reynolds H. Toney) (rtoney@odot.org)

Check the note numbering. The third note is Note 42 and the fourth note is Note 5

Response:

Editorial – all notes will be checked after all other changes are made

- viii) T 40 as RXX Standard Practice for Sampling Asphalt Materials, 45-Yes, 1-No, 7-No vote
Editorial comments received and incorporated. Queries submitted by AASHTO editorial staff will be included. [T 40 will be re-balloted.](#)

Tennessee Department of Transportation (Brian Egan) (brian.egan@state.tn.us)

Suggest adding to 8.3.2 that Sampling from the distributor nozzle is not a recommended practice.

Response:

Note could be added to a future ballot.

Texas Department of Transportation (Darren Hazlett) (darren.hazlett@txdot.gov)

4.1.2 - We typically don't capture gallon samples of emulsified asphalt. Is this necessary?

6.2 - Hot samples that are immediately sealed can contract when they cool in the container. This can often pop off a friction lid, causing the sample to leak during shipment. It may be better to loosely cover the samples until they have cooled off slightly, then seal.

8.1 - Note the long pipe on the sample valve in the picture. In some cases more than a gallon of sample may need to be discarded to insure that a lead up pipe like this one is cleared.

9.1 - What's the difference between materials in 9.1 and 9.2?

12.2 - in some cases, where the individual containers are not too large, the sample will be the entire container. Also some materials are packaged such that the container is melted with the rest of the material and becomes a modifier, so the sample must be an entire container.

13.3.2 - Also a sample could be taken directly from a distributor nozzle, with similar precautions against samples from the beginning or end of a load.

Response:

4.1.2 – wording for a future ballot will potentially allow sample size to range from 1 quart to 1 gallon

6.2 – editorial

8.1-editorial (7.1.1 already says clearing the line by drawing a minimum of 4 L (1 gal) of material

9.1 – clarification needed from Task Force 2a 2014

12.2 – editorial

13.2 – 8.2.3 lists sampling from a distributor nozzle on the spray bar

Oregon Department of Transportation (Greg Frank Stellmach) (greg.f.stellmach@odot.state.or.us)

This procedure should include a method for inline sampling between a storage tank and the mixing plant.

Response:

Please forward a description and photos of inline sampling for consideration of adding to the standard.

Mississippi Department of Transportation (James A. Williams) (jwilliams@mdot.state.ms.us)

Section 8.2.3 - A note should be added stating that sampling from the nozzle of a spray bar should be done as a last resort. The reason for this is that the chance for contamination of the sample is extremely high due to solvents used to clean the spray bar and nozzles.

Section 13.3.2 - A note should be added stating that material should be flushed through the valve or tap and wasted prior to sample material for testing. This is to help minimize contamination of the sample.

Response:

8.2.3 - Note to be added for future ballot.

13.3.2 – A Note or addition instruction to 13.3 will be added for future ballot.

Rhode Island Department of Transportation (Mark E Felag) (mark.felag@dot.ri.gov) - Negative

Section 4.1.2 - A 1 gallon sample size seems large for this. We recommend that this be reduced to 1 qt.

Response:

See above response to Texas RI agreed to withdraw their negative. Sample size will be re-balloted.

Arkansas State Highway and Transportation Department (Michael C Benson) (michael.benson@arkansashighways.com)

Arkansas has found gallon jugs as acceptable sampling containers for asphalt emulsions. These would not meet the criteria in Section 5.1.2 as wide mouth.

The use of a solvent to clean off a container in Section 6.3. is necessary, but care must be taken in order to not contaminate the sample.

The intent of Note 2 is clear but reads poorly. Recommend replacement of "to allow" with "until".

Response:

5.1.2 – Containers most commonly used are shown.

6.3 – Solvent should not be used

Wording in Note 2 was modified.

Idaho Transportation Department (Michael J Santi) (mike.santi@itd.idaho.gov)

Comments: (4.1.2) Minimum sample size for emulsions is 1 Gallon. ASTM D 140-14 is 1 L.

Response:

See responses to Texas above

Pennsylvania Department of Transportation (Robert D Horwhat) (rhorwhat@pa.gov)

SME - Troy Lehigh: Affirmative, but please address the following:

I don't agree with the required sample size for emulsified asphalt in Section 4.1.2. One liter or quart is sufficient. We don't need to collect 4 liter (1 gallon).

Several items in this ballot contain references to T 40. If this Item is approved, they will need updated. I suggest that they revisit all items in this ballot that reference T 40 and make the changes so we the affected items don't need reviewed/approved once the change from T 40 to RXX is approved.

Response:

*See response to Texas above regarding sample size.
References will be updated to R-66*

General Response:

R-66 will be published for 2015.

A modification regarding sample size will be added and balloted with the 2015 SOM Ballot.

ix) MP XX Materials for Emulsified Asphalt Chip Seals, 44-Yes, 2-No, 7-No vote

Editorial comments are incorporated as appropriate.

Tennessee Department of Transportation (Brian Egan) (brian.egan@state.tn.us)- Negative

Section 5.2 Suggest changing the wording from "shall" to "may". States may prefer to use other types of fog seals and/or prefer fog seals over chip seals not be diluted.

Response:

This was revised to say "may"

Nevada Department of Transportation (Reid G Kaiser) (rkaiser@dot.state.nv.us)- Negative

1. A "cleanness" or "cleanliness" test method would be useful for specifying aggregates with coatings that may affect the performance of the chip seal.
2. Subsection 5.1 specifies rapid set materials when other materials may be suitable. Likewise, subsection 5.2 limits the type of emulsion that can be used for fog seal. Other types of emulsion have been used including rapid and quick set materials.

Response: *1. Author's response is that the No. 200 sieve is essentially a cleanliness spec. 2. Author suggests leaving as is since most agencies use rapid set emulsions. (5/6/15 response form author)*

x) PPXX Standard Practice for Emulsified Asphalt Chip Seal Design, 45-Yes, 1-No, 7-No vote

Editorial comments are incorporated as appropriate [Ballot will be sent out again.](#)

Nevada Department of Transportation (Reid G Kaiser) (rkaiser@dot.state.nv.us)- Negative

1. Section 5: Add a stripping test would help to ensure that emulsions and aggregates are compatible.
2. Subsection 5.1.1: delete recommended application rates for aggregates (10-40 lbs). If this is intended to take the single layer application rate and increase it for broomed off chips, the number is too high and not described sufficiently.
3. Subsection 5.1.2, Equation 1: $W = \text{dry, loose unit weight}; A = \text{emulsified asphalt quantity at } 60^{\circ}\text{F}; G = \text{dry bulk specific gravity}; R = \text{in percent expressed as a decimal?};$ It has been proposed in literature that when the Equation 1 numerator is simply divided by the residual asphalt

present in the emulsion, than flushing is likely to occur. Perhaps the emulsion correction adjustment should be recommended = A + K (theoretical)? Finally, should the Modified Kearby Method Equation be "T + V" rather than "T x V?"

4. Table 1 Add T correction factor for 500 -1000 ADT at 1.05?
5. Subsection 5.1.2: Label Figure 1 vertical axis as "Aggregate Embedment, %."
6. Subsection 5.1.3: 5% to 10% extra in addition to the one-stone layer thick does not represent enough material to prevent tracking of emulsion by the spreader and rollers. These values should be higher, possibly 20 to 30% or more.

Response

1. There is not a national standard. Some agencies use a boiling water test, but most do not have a stripping test. (5/6/15 response from author)
2. Changed to 5 to 25 lbs
3. Equation changed to "+"
4. This was added.
5. This has been done.
6. Nevada DOT corresponded with author and NVDOT will conduct a study in 2015 to evaluate further.

- xi) **MP-XX Materials for Microsurfacing, 45-Yes, 1-No, 7-No vote**
Nevada Department of Transportation (Reid G Kaiser) (rkaiser@dot.state.nv.us) – Negative

Delete Type 1 gradation as it is not used in micro-surfacing treatments, only slurry seal treatments.

Response: We left the Type I gradation spec in because it is often used on airports (runways and taxiways) and in parking lots. (5/6/15 response from author)

- xii) **PP-XX Standard Practice for Micro Surfacing Design, 43-Yes, 2-No, 8-No Vote**
Oregon Department of Transportation (Greg Frank Stellmach) (greg.f.stellmach@odot.state.or.us)- Negative

I understand the intent of this standard, however, is it really needed as it mostly follows existing ISSA Standards.

Response: See above.

Nevada Department of Transportation (Reid G Kaiser) (rkaiser@dot.state.nv.us) – Negative

1. Table 1: relocate requirements for Wet Cohesion under requirements column.
2. Table 1: relocate requirements for Wet Track Abrasion Tests under requirements column.
3. Table 1: add "50" to the requirements for Excess asphalt by LWT Sand Abrasion.
4. Table 1: modify name of last test in Table 1 to read Abrasion Loss and change the maximum to 1.0 grams. A maximum of 3.0 grams indicates a failing system of emulsion and aggregates.
5. Subsection 6.1, recommend to delete second sentence regarding common emulsion requirements. This may be misleading and the ranges are too narrow.
6. Section 8, add suggested limits for residual asphalt, 5.5 to 10.5%, as indicated in ISSA
7. Section 11, require that the mix design report include recommendations for changes necessary to proportions for temperature, wind velocity and other project changes.

Response:

- 1 & 2 – table will be corrected. There was a formatting error.
- 3. Change will be made. “50” was added.
- 4. Changes made.
- 5. Second sentence deleted (response 5/6/15 from author)
- 6. Residual binder range added to Section 6.1 (response 5/6/15 from author)
- 7. Allowable changes to mix proportions are covered by the tolerances specified in 11.2 and can be applied to the system based on any changes to project conditions. (Response 5/6/15 from author)

- b) TS letter ballots
- c) Task Force Reports
 - (1) Task Force 2a-2014-01, T 40 Sampling Asphalt. Members are Mr. Bailey (VA), Mr. Franco, (RI), Mr. Johnson (AMRL), Mr. Peoples (NC), and Mr. Williams (MS). Revisions to T 40 were made to ballot as R-XX. Additional items to be considered based on SOM ballot responses. T 40 will be published. Mr. Horner thanked the group for their work.

2) New Business

- a) Research Proposals Colin spoke about this. Round robins will be needed for new tests that are coming out for P&B statements.
- b) AMRL/CCRL Issues n/a
- c) NCHRP Issues n/a
- d) Correspondence, calls, meetings/ Presentation by Industry
 - (1) Delmar Salomon, Digital Paddle Viscometer. Proposed new standard. Delmar spoke about this. Precision statements are being developed based on round robin studies.
- e) Proposed New Standards Colin spoke about this. Need design spec for treatment and construction guide specs. We are talking to the AASHTO Subcommittee on Construction.
- f) Proposed New Task Forces ND, MS, Federal Lands are participating in a new task force. This TF will also address the 14-day issue discussed earlier.
- g) Standards Requiring Reconfirmation
 - (1) T 300 Force Ductility Test on Asphalt Materials
 - (2) PP 71 Certifying Suppliers of Emulsified Asphalt
 - (3) PP 72 Recovering Residue from Emulsified Asphalt Using Low-Temperature Evaporative Techniques
- ii) SOM Ballot Items (including any ASTM changes)

3) Open Discussion Various topics were discussed.

4) Adjourn The meeting was adjourned at 12:40 p.m. EST.

Attendance:

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- ② AR DOT: Michael Benson (Michael.Benson@ahrd.ar.gov) and Dawn Richards
- ② CA DOT: Al Vasquez (albert.vasquez@dot.ca.gov)
- ② ME DOT: Rick Bradbury (Richard.Bradbury@maine.gov)
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- ② RI DOT: Mark Felag (mark.felag@dot.ri.gov) and Colin Franco
- ② WS DOT: Steve Davis (davisSJ@wsdot.wa.gov) and Steve Landers