AASHTO Accreditation Policy and Guidance on Mineral Matter Determinations during Quantitative Extraction of Asphalt Mixture Testing per AASHTO T 164 and ASTM D2172

There are two policies that are relevant to the determination of mineral matter in extract. One policy is regarding whether the laboratory performs mineral matter determinations. The second policy is regarding whether the laboratory is performing the volumetric method of mineral matter determination.

Policy 1: Mineral Matter not Determined

Policy taken from relevant sections of AASHTO T 164, Standard Method of Test for Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt (HMA) and ASTM D2172, Standard Test Methods for Quantitative Extraction of Asphalt Binder from Asphalt Mixtures

AASHTO T 164-14 (2018)

12.4 Collect the extract and washings in an appropriate container for mineral matter determination.
12.6 (Method A) Determine the amount of mineral matter in the extract by one of the procedures specified in Annex A1.
16.2.7 (Method B) Determine the mineral matter in the extraction solution by one of the procedures specified in Annex A1.
20.2.5 (Method D) Determine the mineral matter in the extraction solution by one of the procedures specified in Annex A1.
20.2.9 (Method E-I) Determine the mineral matter in the extraction solution by one of the procedures specified in Annex A1 (Note 22).
Note 22 – Sections 25.2.9 and 25.2.15 may be omitted when this method is used only for control of asphalt binder content during HMA production (plant control).
20.2.15 (Method E-II) Determine the mineral matter in the extraction solution by one of the procedures specified in Annex A1 (Note 22).

ASTM D2172-17e1

13.1 Corrections for mineral matter may be omitted when this test method is used only for control of asphalt mixture binder content during construction (plant control).

Policy

The AASHTO Accreditation Program (AAP) will allow all laboratories to maintain accreditation for a version of T 164 or D2172 whether mineral matter is customarily determined or not. Laboratories that do not customarily determine mineral matter will be listed with the statement (Mineral Matter not Determined) following the standard test method designation.

Rationale

Some laboratories customarily do not perform mineral matter determinations on the extract resulting from the chemical extraction of asphalt binder from aggregates. ASTM specifically allows mineral matter determinations to be omitted if the testing is being performed for quality control purposes. AASHTO specifically allows mineral matter determinations to be omitted only if the laboratory is performing Method E for quality control purposes.

If the AAP only accredits laboratories if they present mineral matter determinations, laboratories are likely to attempt to perform this determination once per assessment tour only, giving the false impression that they are customarily performing the mineral matter determination.

By providing an option for laboratories to maintain accreditation for a version of the methods that omits mineral matter determinations, the AAP is contributing to improvements in transparency so that specifying agencies can select laboratories for projects using more accurate information.

For example, if the laboratory is performing quality control testing, a laboratory accredited for both T 164 and T 164 (Mineral Matter not Determined) would be appropriate choices. However, if the laboratory is being hired for quality assurance testing, only the laboratory accredited for T 164 would be the appropriate choice.

Guidance for the Assessment

During an AASHTO re:source Assessment, the laboratory shall present the test method as it is customarily performed at the laboratory. The Assessor will determine if the laboratory is performing this test for quality control of the binder (ex. asphalt mixture plant) and write either a nonconformity or informational finding based on the situation presented:

a) A nonconformity will be noted if the laboratory did not perform the mineral matter determination if the laboratory performs T 164 Method A, B, or D.
b) A nonconformity will be noted if the laboratory did not perform the mineral matter determination if the laboratory performs T 164 Method E-I or E-II AND the laboratory is not performing this test for quality control testing of percent binder in the asphalt mixture only.
c) A nonconformity will be noted if the laboratory did not perform the mineral matter determination while presenting D2172 for any reason other than quality control of binder content in the asphalt mixture.
d) An informational finding will be noted if the laboratory did not perform the mineral matter determination while presenting D2172 or T 164 Method E-I or E-II AND the laboratory is only performing this test for quality control testing of percent binder in the asphalt mixture.

Guidance for AASHTO Accreditation

Laboratories that determine mineral matter and include it in their determinations of percent binder and aggregate gradations will be able to maintain accreditation for T164 and D2172. Laboratories that do not determine mineral matter will be able to maintain accreditation for T164 (Mineral Matter not Determined) and D2172 (Mineral Matter not Determined).

If the laboratory chooses to resolve the nonconformity noted under T 164 and D2172 or wishes to update its accreditation listing from T 164 (Mineral Matter not Determined) and D2172 (Mineral Matter not Determined), the laboratory shall undergo a remote assessment for demonstration of the mineral matter determination.

Fees are required to be paid by the laboratory for the remote assessment. All nonconformities noted shall be resolved by the laboratory before accreditation can be granted. If the demonstration is performed poorly, an additional remote assessment will be required.

Remote Assessments

The remote assessment will be carried out according to the AASHTO re:source Policy and Guidance on Remote Assessments.

Prior to the remote assessment, the laboratory shall present:

a) Training and evaluation records for the all technicians who will be performing mineral matter determinations at the laboratory.
b) Evidence that the laboratory possesses the appropriate equipment required to perform mineral matter determinations.
c) A copy of the calculation worksheet used by the laboratory showing how the mineral matter determination will factor into both the percent binder and the resulting aggregate gradation results.

Policy 2: Mineral Matter Determination – Volumetric Method

Policy taken from relevant sections of AASHTO T 164, Standard Method of Test for Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt (HMA) and ASTM D2172, Standard Test Methods for Quantitative Extraction of Asphalt Binder from Asphalt Mixtures

AASHTO T 164-14 (2018)

A1.3.2.4: Calculate the mass of fines in the extract as follows:

$W4 = K (M_2 – G_3V_1)$ (A1.3)

where:

$K = G_2 / G_2 – G_3$

G_2 = *specific gravity of fines as determined in accordance with* ***T 84****;*

G_3 = *specific gravity of asphalt binder as determined in accordance with* ***T 228****;*

ASTM D2172-17e1

13.4.4. Calculate the mass of fines in the extract as follows:

$M_3 = K (M_2 – G_3V_1)$

where:

$K = G_2 / G_2 – G_3$

G_2 = *specific gravity of fines as determined in accordance with* ***C128****;*

G_3 = *specific gravity of asphalt binder as determined in accordance with* ***D70****;*

Policy

The AASHTO Accreditation Program (AAP) will allow a laboratory that determines the mineral matter content volumetrically to maintain accreditation for T 164 or D2172 even if the test results for T 84, T 228, C128, or D70 were performed by the supplier of the materials rather than the laboratory.

If the results of T 84, T 228, C128, or D70 were obtained from the supplier, the report shall indicate that the results were obtained from the supplier.

Rationale

The equations specified in the test methods for determining the mass of fines in the extract requires the test results for T 84 and T 228 or C128 and D70; however, these tests are not typically determined by asphalt mixture laboratories and require special equipment and testing competency.

Guidance for the Assessment

During an AASHTO re:source Assessment, if the laboratory demonstrates a determination of the mineral matter content by the volumetric method but does not perform test methods T 84 and T 228 or C128, and D70, the Assessor will not write a nonconformity unless the laboratory does not have access to the test results and cannot determine the mass of fines. Test results cannot be assumed without evidence of the source of the test results, and the laboratory shall document that the results were obtained by the supplier where relevant.

If the laboratory is unaware of how to acquire the test results for T 84 and T 228 or C128 and D70, the Assessor shall notify the laboratory that accreditation may be offered for T164 (Mineral Matter not Determined) and D2172 (Mineral Matter not Determined) if the laboratory meets the requirements for this designation according to Policy 1 of this document.

Guidance for AASHTO Accreditation

Laboratories that determine mineral matter volumetrically and include it in their determinations of percent binder and aggregate gradations will be able to maintain accreditation for T164 and D2172 even if they are not accredited for T 84, T 228, C128, and D70. Laboratories that do not determine mineral matter will be able to maintain accreditation for T164 (Mineral Matter not Determined) and D2172 (Mineral Matter not Determined).