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1 July 2018

## Committee D04 on Road and Paving Materials Subcommittee D04.25 on Analysis of Asphalt Mixtures

**Research Report: D04-1041** 

# Interlaboratory Study to Establish Precision Statements for ASTM D8159, Test Method for Automated Extraction of Asphalt Binder from Asphalt Mixtures

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#### 1. Introduction:

Interlaboratory Study 1532 was conducted to establish a precision statement for D8159, Test Method for Automated Extraction of Asphalt Binder from Asphalt Mixtures.

#### 2. Test Method:

The Test Method used for this ILS is D8159-18. To obtain a copy of D8159, go to ASTM's website, <u>www.astm.org</u>, or contact ASTM Customer Service by phone at 610-832-9585 (8:30 a.m. - 4:30 p.m. Eastern U.S. Standard Time, Monday through Friday) or by email at <u>service@astm.org</u>.

#### **3. Participating Laboratories:**

The following laboratories participated in this interlaboratory study:

Laboratory Name	Contact First Name	Contact Last Name		Address 1	City		Zip Code	Countr y
Illinois Center for Transportation	Greg	Renshaw	grenshaw@illinois.edu	1611 Titan Dr	Rantoul	Illinois	61866	USA
Chicago Testing Lab	Abdul	Dahhan	adahhan@chicagotestinglab.com	30W114 Butterfield Rd	Warrenville	Illinois	60555	USA
Illinois Department of Transportation D1	George	Houston	george.houston@illinois.gov	201 West Center Ct	Schaumburg	Illinois	60196	USA
Illinois Department of Transportation D4	Steven	Worsfold	steve.worsfold@illinois.gov	401 Main St	Peoria	Illinois	61602	USA
STATE Testing	Jay	Behnke	jbehnke@statetestingllc.com	570 Rock Rd Dr	East Dundee	Illinois	60118	USA
Arrow Construction	John	Healy	jhealy@arrowroad.com	3401 Busse Rd	Mt Prospect	Illinois	60056	USA

## 4. **Description of Samples:**

The samples for this ILS were ordered from AASHTO re:source's Profiency Sample Program (PSP). These were extra samples from its annual asphalt extraction PSP. AASHTO re:source sent the samples blind to the participants and provided IAPA with the actual sample numbers.

#### 5. Interlaboratory Study Instructions

Laboratory participants were emailed the test program instructions. For a copy of the instructions, please see Annex A.

#### 6. Description of Equipment/Apparatus<sup>1</sup>:

For information on the equipment/apparatus used by each laboratory, please see Annex B.

## 7. Data Report Forms:

Each laboratory was provided with a data report form for the collection of data. A copy of the data is provided in Annex C.

Please note: The laboratories have been randomly coded and cannot be identified herein.

#### 8. Statistical Data Summary:

A summary of the statistics calculated from the data returned by the participating laboratories is provided in Annex C.

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<sup>&</sup>lt;sup>1</sup> The equipment listed was used to develop a precision statement for D8159-18. This listing is not an endorsement or certification by ASTM International.

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#### 9. Precision and Bias Statement:

9.1 The precision of this test method is based on an interlaboratory study of D8159, Standard Test Method Standard Test Method for Automated Extraction of Asphalt Binder from Asphalt Mixtures, conducted in 2018, six laboratories tested a single asphalt mixture. Every "test result" represents an individual determination. Each laboratory submitted a single test result, from a single operator. Except for the lack of replicates, the design and analysis of the data was based on Practice E691; the details are given in ASTM Research Report No. D04-1041.

9.1.1 *Repeatability limit* (r) - Two test results obtained within one laboratory shall be judged not equivalent if they differ by more than the "r" value for that material; "r" is the interval representing the critical difference between two test results for the same material, obtained by the same operator using the same equipment on the same day in the same laboratory.

9.1.1.1 Repeatability limits cannot be determined without replicate test results from the participating laboratories.

9.1.2 Reproducibility limit (R) - The difference between two single and independent results obtained by different operators applying the same test method in different laboratories using different apparatus on identical test material would, in the long run, in the normal and correct operation of the test method, exceed the following values only in one case in 20.

9.1.2.1 Reproducibility can be interpreted as maximum difference between two results, obtained under reproducibility conditions, that is accepted as plausible due to random causes under normal and correct operation of the test method.

9.1.2.2 Reproducibility limits are listed in Table 1 below.

9.1.3 The above terms (repeatability limit and reproducibility limit) are used as specified in Practice E 177.

9.1.4 Any judgment in accordance with statements 9.1.1 and 9.1.2 would have an approximate 95% probability of being correct.

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