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**Committee E12 on Color and Appearance
Subcommittee E12.10 on Retroreflection**

Research Report E12-1007

**Interlaboratory Study to Establish Precision Statements for ASTM
E2832-12: Standard Test Method for
Measuring the Coefficient of Retroreflected Luminance of Pavement
Markings in a Standard Condition of Continuous Wetting**

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1. Introduction:

Interlaboratory Study 710 was conducted to establish a precision statement for E2832- Standard Test Method for Measuring the Coefficient of Retroreflected Luminance of Pavement Markings in a Standard Condition of Continuous Wetting.

2. Test Method:

The Test Method used for this ILS is WK19806-11. To obtain a copy of WK19806-11, go to ASTM's website, www.astm.org, 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 service@astm.org.

3. Participating Laboratories:

The following laboratories participated in this interlaboratory study

Weisker	PPP
Flint	Swarco
Potters	Ennis
Georgia DOT	Florida DOT, maintenance section
3M	Florida DOT, traffic section

4. Description of Samples:

There were 5 different in-service edge line pavement markings used for this study. There were two measurement locations identified on each material. The roadway was US 19 near Perry, FL. The markings were approximately six months old.

Location 1 and 2: Thermoplastics with a double drop of Type 3 beads and 3M reflective elements

Location 3 and 4: Inverted Rib Thermoplastics with a double drop of Type 1 and 1.9 beads

Location 5 and 6: Thermoplastics with a double drop of Type 1 and 4 beads

Location 7 and 8: Thermoplastics with a double drop of Type 3 and Visimax

Location 9 and 10: Thermoplastics with a single drop of Type 1 beads

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/Apparatus¹:

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

¹ The equipment listed was used to develop a precision statement for E2832-12. This listing is not an endorsement or certification by ASTM International.
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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 B.

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.

9. Precision and Bias Statement:

9.1 The precision of this test method is based on an interlaboratory study of ASTM WK19806, New Test Method for Measuring the Coefficient of Retroreflected Luminance of Pavement Markings in a Standard Condition of Continuous Wetting (RL-Rain), conducted in 2010. A total of ten analysts, representing different companies, participated in this study, testing ten distinct locations on a specially prepared section of pavement. Each “test result” reported represents an individual determination, and all participants were asked to report duplicate test results for each area tested. Practice E691 was followed for the design and analysis of the data; the details are given in ASTM Research Report No. E12-1007.¹

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 are listed in Table 1 below.

9.1.2 *Reproducibility limit (R)* - Two test results 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 different operators using different equipment in different laboratories.

9.1.2.1 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.