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

Research Report E12-1005

**Interlaboratory Study to Establish Precision Statements for ASTM
E1710-11, Measurement of Retroreflective Pavement Marking
Materials with CEN-Prescribed Geometry Using a Portable
Retroreflectometer**

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1. Introduction:

Interlaboratory Study 596 was conducted to establish a precision statement for E1710, Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer.

2. Test Method:

The Test Method used for this ILS is E1710-05. To obtain a copy of E1710, 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

	Lab	User First Name	User Last Name	Email Address
1	Flint	Vagn	Askjaer	vaskjaer@flintrading.com
2	Potters	Tom	Bell	Tom.Bell@pottersbeads.com
3	Gamma	Eric	Nelson	enelson@gamma-sci.com
4	Swarco	Kevin	Stanley	gary.ware@swarco.com
5	Ennis	Jerry	Britt	jerry.britt@ennispaint.net
6	3M	Gene	Carlson	ghcarlson1@mmm.com
7	Zehnter	Peter	Zehnter	zehntner@zehntner.com
8	PPP	Steve	Norkus	steve.norkus@pppcatalog.com
9	Weissker	Tony	Wade	tony.wade@weissker.com
10	Flasher	Paul	Helfrich	paulh@flasherequipment.com

4. Description of Samples:

There were 10 samples of varying targeted results used for this study. Each sample was prepared and provided to TTI. TTI chose 10 samples representing a range of pavement markings in use. Below is a list of the samples with the corresponding supplier:

1. Ap Provided by TTI
2. At Provided by TTI
3. D Provided by TTI
4. F Provided by Flint Trading, Inc.
5. H Provided by TTI
6. K Provided by TTI
7. N Provided by TTI
8. O Provided by TTI
9. Q Provided by 3M
10. R Provided by TTI

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 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 D.

9. Precision and Bias Statement:

9.1 The precision of this test method is based on an interlaboratory study of ASTM E1710, Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer, conducted in 2010. Ten laboratories participated in this study. Each of the labs was asked to report fifteen replicate test results for ten different materials. Every “test result” reported represents a single determination or measurement. Practice E691 was followed for the design and analysis of the data; the details are given in ASTM Research Report No. E12-1005.ⁱ

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