



Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer¹

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1. Scope

1.1 This test method covers measurement of the retroreflective properties of horizontal pavement marking materials containing retroreflecting beads, such as traffic stripes and surface symbols, using a portable retroreflectometer that can be placed on the road delineation to measure the retroreflection at a prescribed geometry.

NOTE 1—The restriction to bead based materials is for the purpose of ensuring a sufficiently gradual optical response function (from points of the source aperture to points of the receiver aperture) to allow generous sized instrument source and receiver apertures.

1.2 The entrance and observation angles of the retroreflectometer affect the readings. As specified by the European Committee for Standardization (CEN), the entrance and observation angles shall be 88.76° and 1.05° , respectively.

1.3 This test method is intended to be used for field measurement of pavement markings but may be used to measure the performance of materials on sample panels before placing the marking material in the field.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

[D4061 Test Method for Retroreflectance of Horizontal Coatings](#)

[D6359 Specification for Minimum Retroreflectance of](#)

[Newly Applied Pavement Marking Using Portable Hand-Operated Instruments \(Withdrawn 2006\)](#)³

[E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods](#)

[E284 Terminology of Appearance](#)

[E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method](#)

[E809 Practice for Measuring Photometric Characteristics of Retroreflectors](#)

2.2 Other Standard:

[CEN EN 1436 Road Marking Materials—Road Marking Performance for Road Users](#)⁴

3. Terminology

3.1 The terminology used in this test method generally agrees with that used in Terminology [E284](#).

3.2 *Definitions*—The delimiting phrase “in retroreflection” applies to each of the following definitions when used outside the context of this or other retroreflection test methods:

3.2.1 *coefficient of retroreflected luminance, R_L , n* —the ratio of the luminance, L , of a projected surface to the normal illuminance, $E_\perp$, at the surface on a plane normal to the incident light, expressed in candelas per square metre per lux ($\text{cd}\cdot\text{m}^{-2}\cdot\text{lx}^{-1}$).

3.2.1.1 *Discussion*—Because of the low luminance of pavement markings, the units used commonly are millicandelas per square metre per lux ($\text{mcd}\cdot\text{m}^{-2}\cdot\text{lx}^{-1}$).

3.2.2 *co-entrance angle, β_C , n* —the complement of the entrance angle ($90^\circ - \beta$).

3.2.3 *co-viewing angle, ν_C , n* —the complement of the viewing angle ($90^\circ - \nu$).

3.2.4 *entrance angle, β , n* —the angle between the illumination axis and the retroreflector axis.

3.2.5 *observation angle, α , n* —the angle between the illumination axis and the observation axis.

¹ This test method is under the jurisdiction of ASTM Committee [E12](#) on Color and Appearance and is the direct responsibility of Subcommittee [E12.10](#) on Retroreflection.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from European Committee for Standardization (CEN), 36 rue de Stassart, B-1050, Brussels, Belgium, <http://www.cenorm.be>.