



Designation: D4061 – 13 (Reapproved 2018)

Standard Test Method for Retroreflectance of Horizontal Coatings¹

This standard is issued under the fixed designation D4061; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method describes the instrumental measurement of the retroreflective properties of horizontal surfacing materials, such as traffic stripe paint systems, traffic tapes, and traffic surface symbols.

1.2 Specimen preparation, size, and shape must be determined and specified by the user of this test method. Likewise, the user must specify the observation and entrance angles to be used (see Fig. 1).

1.3 The geometric requirements of this test method are based on materials for which the relative retroreflectance changes less than approximately 50 % over the observation angle range from 0.2 to 0.5°. This is illustrated in Fig. 2.

1.4 This test method is a laboratory test and requires a facility that can be darkened sufficiently so that stray light does not affect the test results. This facility must be capable of housing the required 15-m test distance.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

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. Referenced Documents

2.1 ASTM Standards:²

E284 Terminology of Appearance

E308 Practice for Computing the Colors of Objects by Using the CIE System

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E808 Practice for Describing Retroreflection

E809 Practice for Measuring Photometric Characteristics of Retroreflectors

2.2 CIE Publication:³

No. 54 Retroreflection Definition and Measurement

3. Terminology

3.1 The terms and definitions in Terminology E284 apply to this test method.

3.2 Definitions:

3.2.1 *coefficient of retroreflected luminance, R_L , n* —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 ($\text{cd}\cdot\text{m}^{-2}\cdot\text{lx}^{-1}$).

$$R_L = (L/E_\perp) \quad (1)$$

3.2.2 *datum mark, n —in retroreflection*, an indication on the retroreflector that is used to define the orientation of the retroreflector with respect to rotation about the retroreflector axis.

3.2.2.1 *Discussion*—The datum mark must not lie on the retroreflector axis.

3.2.3 *entrance angle, β , n —in retroreflection*, angle between the illumination axis and the retroreflector axis.

3.2.3.1 *Discussion*—For plane retroreflective surfaces, the entrance angle is no larger than 90°.

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 Available from U.S. National Committee of the CIE (International Commission on Illumination), C/o Thomas M. Lemons, TLA-Lighting Consultants, Inc., 7 Pond St., Salem, MA 01970, <http://www.cie-usnc.org>.