



# Standard Test Method for Field Measurement of Raised Retroreflective Pavement Markers Using a Portable Retroreflectometer<sup>1</sup>

This standard is issued under the fixed designation E1696; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers the measurement of the retroreflective properties of raised retroreflective pavement markers at a prescribed geometry, by means of a portable retroreflectometer that can be used in the field. The measurements can be compared to minimum requirements to determine the need for replacement.

1.2 The observation angle specified for retroreflectometers in this test method is that currently specified for raised pavement markers in the United States and may differ from the angles used elsewhere. For other jurisdictions, replace the observations angle specified herein with the observation angle specified by the pertinent agency.

1.3 This test method is intended to be used for field measurement of raised retroreflective pavement markers but may also be used to measure the performance of new markers before they are placed in the field.

1.4 This test method covers measurements of raised pavement markers mounted on a road surface or mounted in snow-plowable metal castings.

1.5 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.6 *The 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*

<sup>1</sup> 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*:<sup>2</sup>

E284 Terminology of Appearance

E808 Practice for Describing Retroreflection

E809 Practice for Measuring Photometric Characteristics of Retroreflectors

## 3. Terminology

3.1 The terms and definitions in Terminology E284 are applicable to this test method. Some terms particular to retroreflection are defined and illustrated in Practice E808.

3.2 *Definitions*:

3.2.1 The delimiting phrase “in retroreflection” applies to each of the following definitions when used outside the context of this or other retroreflection standards.

3.2.2 *coefficient of luminous intensity,  $R_p$ ,  $n$ —of a retroreflector*, ratio of the luminous intensity ( $I$ ) of the retroreflector in the direction of observation to the illuminance ( $E_{\text{Int}}$ ) at the retroreflector on a plane perpendicular to the direction of incident light, expressed in candelas per lux ( $\text{cd}\cdot\text{lx}^{-1}$ ).

3.2.2.1 *Discussion*—When values are low, the coefficient of (retroreflected) luminous intensity may be given in millicandelas per lux ( $\text{mcd}\cdot\text{lx}^{-1}$ ).  $R_p = (I/E_{\text{Int}})$ .

3.2.3 *portable retroreflectometer*—a hand-held instrument that can be used in the field or in the laboratory for measurement of retroreflectance.

3.2.3.1 *Discussion*—In this test method, “portable retroreflectometer” refers to a hand-held instrument that can be placed over a raised retroreflective pavement marker to measure the coefficient of luminous intensity with a prescribed geometry.

3.2.4 *instrument standard,  $n$* —a working standard used to standardize the portable retroreflectometer.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.