



Designation: D8379/D8379M – 21

# Standard Practice for Evaluating Nighttime Retroreflective Sheeting Effectiveness Using Positive-Contrast Textual Sign Scenario Performance Analysis<sup>1</sup>

This standard is issued under the fixed designation D8379/D8379M; 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 practice provides a framework to evaluate retroreflective sheeting performance in nighttime driving conditions without a need for field evaluations through a set of sign viewing scenarios representing common use-cases. The evaluation of performance of a specific sheeting is achieved by comparing the luminance provided by a sheeting to the luminance needed by drivers in each scenario. This comparison is expressed in terms of a “Performance Index,” which is a measure for how well the luminance provided to the driver meets their needs, in each of the scenarios. Comparison of the performance index values for different sheeting allows the user to predict differences in nighttime retroreflective performance when those sheeting are used on installed signs.

1.2 The driver-needs data is based on textual signs (not on symbolic signs) with positive contrast (sign text being brighter than its background), and the headlamp illumination is assumed to be low-beams; therefore, performance index is applicable only to textual signs viewed under low-beam headlamp illumination.

1.3 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The value stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

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

1.5 *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.*

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

**B209/B209M** Specification for Aluminum and Aluminum-Alloy Sheet and Plate

**B449** Specification for Chromates on Aluminum

**D8** Terminology Relating to Materials for Roads and Pavements

**E284** Terminology of Appearance

**E808** Practice for Describing Retroreflection

**E809** Practice for Measuring Photometric Characteristics of Retroreflectors

### 2.2 BSI Standard:<sup>3</sup>

**BS 8408:2005** Road Traffic Signs. Testing and Performance of Microprismatic Retroreflective Sheeting Materials. Specification (Withdrawn)

## 3. Terminology

3.1 *Definitions*—For definitions of technical terms used in this practice, see Terminologies **D8** and **E284**.

### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *legibility index,  $n$* —a surrogate metric for the size of the image on the retina, expressed in terms of the longitudinal (roadway) distance to the sign divided by the height of the uppercase alphanumeric on the text.

3.2.2 *legibility range,  $n$* —the range of distances to a sign, expressed longitudinally along the roadway centerline, that are between a legibility index of 40 ft/in. [4.8 m/cm] and 20 ft/in. [2.4 m/cm].

3.2.3 *performance index,  $n$* —a measure that approximates a sign sheeting’s performance, in terms of luminance observed by the driver, in a given scenario.

<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.

<sup>3</sup> Available from British Standards Institution (BSI), 389 Chiswick High Rd., London W4 4AL, U.K., <http://www.bsigroup.com>.

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee **D04** on Road and Paving Materials and is the direct responsibility of Subcommittee **D04.38** on Highway Traffic Control Materials.

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