



Standard Specification for Extended Life Type, Nonplowable, Raised Retroreflective Pavement Markers¹

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1. Scope

1.1 This specification covers nonplowable, retroreflective raised pavement markers for nighttime lane marking and delineation.

1.2 The values stated in inch-pound units are to be regarded as the standard except where noted in the document. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 The following precautionary caveat pertains only to the test methods portion, Section 9, of this specification: *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

- D5 Test Method for Penetration of Bituminous Materials
- D36 Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)
- D71 Test Method for Relative Density of Solid Pitch and Asphalt (Displacement Method)
- D92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester
- D113 Test Method for Ductility of Bituminous Materials
- D1785 Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
- D3111 Test Method for Flexibility Determination of Hot-Melt Adhesives by Mandrel Bend Test Method
- D4402 Test Method for Viscosity Determination of Asphalt

¹ This specification 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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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.

at Elevated Temperatures Using a Rotational Viscometer
D5329 Test Methods for Sealants and Fillers, Hot-Applied,
for Joints and Cracks in Asphaltic and Portland Cement
Concrete Pavements

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

E808 Practice for Describing Retroreflection

E809 Practice for Measuring Photometric Characteristics of
Retroreflectors

E811 Practice for Measuring Colorimetric Characteristics of
Retroreflectors Under Nighttime Conditions

2.2 Federal Specifications:³

TT-T-291 Thinner, Paint, Mineral Spirits, Regular and Odor-
less

2.3 AASHTO Standards:⁴

AASHTO M237 Epoxy Resin Adhesive for Bonding Traffic
Markers to Hardened Concrete

3. Terminology

3.1 Definitions:

3.1.1 *cleanability*—the ability of a raised retroreflective marker to keep its optical surfaces clean under traffic and environmental conditions.

3.1.2 *coefficient of luminous intensity*, R_f —the ratio of the luminous intensity (I) of the retroreflector in the direction of observation to the illuminance (E) at the retroreflector on a plane perpendicular to the direction of the incident light, expressed in candelas per lux (cd/lx) (see Practice E808 and Terminology E284).

3.1.2.1 *Discussion*—The values presented for the coefficient of luminous intensity are presented in SI units, which are the accepted worldwide norm for expressing this value, rather than in inch-pounds. When values are low, the coefficient of

³ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

⁴ Available from American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Suite 249, Washington, DC 20001, <http://www.transportation.org>.