



## Standard Specification for Preformed Plastic Pavement Marking Tape for Limited Service Life<sup>1</sup>

This standard is issued under the fixed designation D 4592; 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 specification covers white or yellow preformed plastic pavement markings that are designed to provide a service life of up to one year. The markings are intended for use as longitudinal, transverse or word/symbol pavement markings that provide delineation day and night. The markings shall be either removable or nonremovable.

1.2 The values stated in SI units are to be regarded as the standard.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 1000 Test Methods for Pressure-Sensitive Adhesive Coated Tapes Used for Electrical and Electronic Insulation<sup>2</sup>

D 4061 Test Method for Retroreflectance of Horizontal Coatings<sup>3</sup>

E 303 Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester<sup>4</sup>

E 313 Practice for Calculating Yellowness and Whiteness Indices from Instrumentally Measured Color Coordinates<sup>3</sup>

#### 2.2 Federal Standards:

FHWA Highway Yellow Color Tolerance Chart P.R. No.1<sup>5</sup>  
Fed Std Test Method 141<sup>6</sup>

### 3. Terminology

#### 3.1 Definitions:

3.1.1 *limited service life or period*—a minimum service period of three months when placed in accordance with the manufacturers recommended procedures on pavement surfaces having no more than 15 000 average daily traffic/lane.

3.1.2 *retroreflection*—reflection in which radiation is returned in directions close to the direction from which it came,

this property being maintained over wide variations of the direction of the incident radiation.

3.1.3 *retroreflector*—surface or device that reflects and returns a relatively high proportion of light in a direction close to the light source. This characteristic is maintained over a wide variation of the angle made by the incident light ray and the normal to retroreflective surface.

### 4. Classification

4.1 Pavement marking material manufactured according to this specification shall be identified as Type I or Type II:

4.1.1 *Type I (Removable)*—Marking materials, after serving the intended limited service life, shall be removable from asphalt or portland cement concrete surfaces at pavement temperatures above 4°C (40°F) intact or in pieces no less than 2 ft in length, either manually or with a mechanical device without the use of heat, solvents, grinding, or blasting that would damage or discolor the pavement so as to leave an impressed traffic lane mark.

4.1.2 *Type II (Non-Removable)*—This type of material shall not be required to have removal characteristics as in 4.1.1.

### 5. General Requirements

5.1 The marking material shall be a reflective film coated with a pressure-sensitive adhesive with or without a protective liner.

5.2 The marking material shall adhere to asphalt or portland cement concrete roadway surfaces when applied according to the manufacturer's recommended procedures on pavement surfaces having temperatures down to 10°C (50°F) at the time of application.

5.3 The marking material shall be flexible and formable and shall conform to the typical road pavement surface.

5.4 Immediately following application, the material shall not require a cure or set time prior to opening to traffic.

5.5 The material as supplied shall be free of cracks, and have true, straight, and unbroken edges.

### 6. Retroreflectance and Color

6.1 The striping material shall be retroreflective, reflecting white or yellow, respectively, and shall be readily visible when viewed with automobile headlights at night and shall have minimum reflective values as shown in Table 1 when measured in accordance with the photometric testing procedures of Test Method D 4061. Reflective values shall be expressed as

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D 04.38 on Highway Traffic Control Materials.

Current edition approved Nov. 10, 1996. Published January 1997. Originally published as D 4592 – 86. Last previous edition D 4592 – 93.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 10.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 06.01.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 04.03.

<sup>5</sup> Available from Hale Color Charts, 11765 Old Frederic Rd., Marriotsville, MD 21104.

<sup>6</sup> Available from Naval Publications and Forms Center, 5801 Tabor Ave, Philadelphia, PA 19120.

**TABLE 1 Reflective Values for Dry Samples ( $\text{mcd}\cdot\text{m}^{-2}$ )  $\text{lx}^{-1}$  ( $\text{mcd}\cdot\text{ft}^{-2}(\text{fc})^{-1}$ )**

Observation Angle	Reflective Value, ( $R_L$ )	
	White	Yellow
0.2°	1360	820
0.5°	760	510

coefficient of retroreflected luminance ( $R_L$ ) in millicandelas per square metre per lux.

### 6.2 Color:

6.2.1 The daylight color of white striping material shall be such that the whiteness index as determined in Practice E 313 is at least 40. Color shall be determined using 0/45 or 45/0 geometry.

6.2.2 The daylight color of yellow marking material shall conform to the requirements of FHWA Highway Yellow Color Tolerance Chart.

## 7. Adhesion

7.1 A sample of material, 25.4 mm in width, applied according to the manufacturer's recommended procedure and tested in accordance with Test Method D 1000, shall have minimum adhesion values as shown in Table 2.

**TABLE 2 Adhesion**

Application Temperature	Test Temperature	Minimum Adhesion, N
10°C (50°F)	10°C (50°F)	4.88
24°C (75°F)	24°C (75°F)	4.88
46°C (115°F)	46°C (115°F)	4.88

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## 8. Durability and Wear Resistance

8.1 The marking material, when applied in accordance with the manufacturer's recommended procedures, shall show no appreciable change of color, lifting, or shrinkage during the normal service life of the applied material. Samples of the material applied to standard specimen plates and tested in accordance with Federal Test Method 141, Method 6192 using a CS-17 wheel, and 1000 g load, shall show no wear through to the backing after 2000 cycles for Type I and 1000 cycles for Type II.

## 9. Skid Resistance

9.1 The marking material shall have an average minimum frictional resistance value of 35 BPN (British Pendulum Number) when tested in accordance with Test Method E 303.

## 10. Storage Characteristics

10.1 *Storage Characteristics*—The marking material as supplied shall have a minimum shelf life of one year from the date of purchase when stored at temperatures between 10 and 38°C (50° and 100°F).

## 11. Packaging and Marking

11.1 The marking material shall be packaged in rolls and there shall be no more than 3 splices/50m (164 ft) of length.

11.2 The material shall be packaged in accordance with accepted commercial standards.

## 12. Keywords

12.1 pavement marking; pavement marking tape; retroreflectance; tape; pavement marking