



Designation: D 4960 – 89 (Reapproved 1998)

Standard Test Method for Evaluation of Color for Thermoplastic Traffic Marking Materials¹

This standard is issued under the fixed designation D 4960; 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 covers the instrumental determination of color of thermoplastic traffic marking materials in the CIE 1931 system.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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:*

D 883 Terminology Relating to Plastics²

E 97 Test Method for Directional Reflectance Factor, 45-deg, 0-deg, of Opaque Specimens by Broad-Band Filter Reflectometry³

E 179 Guide for Selection of Geometric Conditions for Measurement of Reflectance and Transmission Properties of Materials⁴

E 284 Terminology of Appearance⁴

E 308 Practice for Computing the Colors of Objects by Using the CIE System⁴

E 1164 Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation⁴

F 412 Terminology Relating to Plastic Piping Systems⁵

3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminology D 883, E 284 and F 412, unless otherwise indicated.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *thermochromism*—a color hue change that takes place in the thermoplastic material due to temperature changes.

3.2.2 *thermoplastic traffic marking material*—a highly filled 100 % total solids highway marking material that when heated to a molten state can be extruded or sprayed onto a road surface and when cooled forms a solid, durable delineator.

4. Summary of Test Method

4.1 The thermoplastic specimen is prepared for this test by melting a sample to its application temperature under continuous agitation and then pouring it into a TFE-fluorocarbon coated pan, to form a patty of approximately 3 in. (7.6 cm) in diameter. The patty is allowed to cool to room temperature before measuring the color. Color measurements are made on the flat side or the top side of the thermoplastic patty.

NOTE 1—No significant color differences are encountered in reading the top or bottom of the patty.

5. Significance and Use

5.1 This test method provides a standard procedure for the determination of color of thermoplastic traffic marking materials. This test method can be used in conjunction with specifications to determine the uniformity of thermoplastic traffic marking materials from batch to batch and that produced by various suppliers.

5.2 There is a slight variation in color standards and colorimeters. This test method is only applicable when results are reported with the instrument model designation and white color calibration standard identification information.

6. Apparatus

6.1 *Agitator Blade*, 6 in. (15 cm) long with a 1/2-in. (1-cm) steel shaft and a 1 3/4 by 1 by 1/8-in. (4.5 by 2.5 by 0.3-cm) straight horizontal steel blade.

6.2 *Drill Press*, or other apparatus capable of agitating the thermoplastic marking material in the electric pots at 600 to 700 r/min during meltdown to the application temperature.

6.3 *Heating Equipment:*

6.3.1 *Gravity Convection Oven*, capable of maintaining 260°C, for melting the thermoplastic traffic marking.

6.3.2 *Hot Plate*, capable of maintaining 537°C.

¹ This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.44 on Traffic Coatings.

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² *Annual Book of ASTM Standards*, Vol 08.01.

³ Discontinued, see 1991 *Annual Book of ASTM Standards*, Vol 06.01.

⁴ *Annual Book of ASTM Standards*, Vol 06.01.

⁵ *Annual Book of ASTM Standards*, Vol 08.04.