



Designation: **D7308 – 07 (Reapproved 2012) D7308 – 17**

## Standard Practice for Sample Preparation of Thermoplastic Traffic Pavement Marking Materials<sup>1</sup>

This standard is issued under the fixed designation D7308; 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 covers the proper preparation of test specimens of thermoplastic traffic pavement marking materials obtained to ensure test results are representative of the material being tested.

1.2 The values stated in SI 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.*

1.4 *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>

**D7307 Practice for Sampling of Thermoplastic Traffic Marking Materials**

### 3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *thermoplastic traffic pavement marking material, n*—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 Practice

4.1 The thermoplastic traffic pavement marking material is prepared for the testing of various physical and chemical properties as outlined in the governing specification by melting a sample of the traffic marking material to its application temperature under continuous agitation. Depending upon the requirements of the governing specification the sample can then be exposed to the required heating time and conditions prior to the preparation of the test specimens or the test specimens may be prepared immediately after the material has reached application ~~temperatures~~ temperature.

4.2 If required by the governing specification that the sample be subjected to an extended periods period of heating prior to the preparation of the test specimen in order to determine the effect of heat history upon various physical or chemical properties, the sample must be melted down in the prescribed manner outlined in this practice prior to being subjected to such conditions.

### 5. Significance and Use

5.1 This practice provides a standard procedure for the preparation of thermoplastic traffic pavement marking material test specimens prior to testing for various properties as called for in the governing specification. Specimens that are prepared using this standard methodology yield test results that are consistent with the material from which it was sampled. Test results from specimens can be used to determine compliance of the thermoplastic traffic pavement marking material to the specification. This

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.44 on Traffic Coatings.

Current edition approved June 1, 2012 June 1, 2017. Published August 2012 June 2017. Originally approved in 2007. Last previous edition approved in 2007 2012 as D7308 – 07–07 (2012). DOI: 10.1520/D7308-07R12:10.1520/D7308-17.

<sup>2</sup> 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.

~~sample preparation guide practice~~ can also be used by manufacturers of these materials to prepare specimens for testing to determine the uniformity of thermoplastic ~~traffic pavement~~ marking materials from batch to batch.

5.2 This practice does not address any issues related to specific testing of the thermoplastic pavement marking materials for any physical or chemical property.

## 6. Apparatus

### 6.1 Procedure A (Preferred):

6.1.1 *Stainless Steel 4000 ml Beaker, 150 by 230-mm diameter high.* Alternatively an unlined 0.95 L (1 qt) or 3.48 L (1 gal) can may be used depending on the sample size.

6.1.2 *Heating Mantle* of sufficient size. Note that aluminum foil may be used to serve as somewhat of a gasket if an unlined metal can is to be used in the heating mantle in place of the stainless steel beaker.

6.1.3 *Temperature Indicator.*

6.1.4 *Thermocouple, iron.*

6.1.5 *Mechanical Stirrer*, capable of stirring. The stirrer should consist of two impellers with a diameter of approximately 63.5 mm mounted on a 7.95-mm diameter shaft of sufficient length.

6.1.6 *Aluminum Lid* to cover the top of the container with a slot to clear the shaft of the mechanical stirrer and the thermocouple.

6.1.7 *Stainless Steel Ladles* with a pouring spout, 60-ml capacity.

6.1.8 *Tachometer* to measure shaft speed of the mechanical mixer.

### 6.2 Procedure B (Alternate):

6.2.1 *Hot Plate* with a maximum temperature setting of approximately 550°C and with sufficient top plate surface area as to extend beyond the surface area of the bottom of the container to be used for melting the sample.

6.2.2 *Unlined Cans*, 0.95 L (1 qt) or 3.48 L (1 gal) as required by the specified sample size.

6.2.3 *Spatula.*

6.2.4 *Gloves.*

6.2.5 *Tongs.*

6.2.6 *Thermometer* (capable of measuring up to 450°F).

## 7. Hazards

7.1 Following this ~~guide practice~~ requires one to work with materials that are heated to very high temperatures (350 to 450°F). Care must be taken to prevent accidental burns.

7.2 Consult the ~~MSDS~~ SDS for the thermoplastic pavement marking material being tested to understand the proper way to handle any accidental burns.

7.3 Wear protective clothing, thermal resistant gloves, and eye protection.

## 8. Procedure

8.1 Obtaining a representative sample is critical in determining the suitability of the material being tested in meeting the required specification or in determining the batch-to-batch consistency of the thermoplastic ~~traffic pavement~~ marking material. Obtain a representative sample by following Practice **D7307**. The size of the sample being tested may vary depending upon the objective of the person conducting the test, varying from an approximate 0.95 L (1 qt) or 1 000 g sample to a 3.48 L (1 gal) or 4 000 g sample. An approximate 0.95 L (1 qt) or 1 000 g sample should be the minimum sample size tested.

### 8.2 Procedure A (Preferred):

8.2.1 This procedure covers the melting of thermoplastic pavement marking material using a heating mantle and a mechanical stirrer. This procedure simulates closely what occurs in the actual use of this material.

8.2.1.1 Set up the apparatus as shown in **Fig. 1**. Wire the heating mantle power cord to the temperature indicator controller in accordance with the manufactures instructions. Mount the controller-indicator in a panel that can be wall mounted to keep the unit away from heat, dirt, and vibrations. When the unit is ready for operation, make a test melt in order to set the proportional band and other adjustment to give a controlled temperature of  $218 \pm 1^\circ\text{C}$  ( $425 \pm 2^\circ\text{F}$ ), or to an alternate temperature as called for in the governing specification.

8.2.1.2 Place one-third to one-half of the granular sample into the container residing in the heating mantle. Attach the stirring shaft to the mechanical stirrer.

8.2.1.3 Turn on the power to the heating mantle and the controller. Start the variable speed mechanical stirrer when the thermoplastic material has softened sufficiently.

8.2.1.4 Slowly add the remainder of the granular sample at a rate so as to maintain continuous stirring.

8.2.1.5 After the entire granular sample has been added to the container set the speed of the mechanical stirrer with the tachometer to a speed of about 100 rpm. Cover the container using the aluminum lid, positioning the lid such that it clears the mixer shaft and the thermocouple.