Designation: D6605 – 06 (Reapproved 2015)

Standard Practice for Determining the Color Stability of Hydrocarbon Resins After Heating[1]

This standard is issued under the fixed designation D6605; 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 practice covers determination of the color stability of a hydrocarbon resin by exposure to a specific temperature for a defined time period in a forced-draft oven.

1.2 Color stability is measured by the change in color of the test resin, measured via the yellowness index color scale, in accordance with Practice E313, or the procedure for Gardner Color, Test Method D6166.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

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

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D6166 Test Method for Color of Pine Chemicals and Related Products (Instrumental Determination of Gardner Color)

D6440 Terminology Relating to Hydrocarbon Resins

E313 Practice for Calculating Yellowness and Whiteness Indices from Instrumentally Measured Color Coordinates

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms relating to hydrocarbon resins, see Terminology D6440.

4. Summary of Practice

4.1 Specimens of the hydrocarbon resin(s) to be tested are placed in 250-mL (8-oz) glass jars, which are placed in a heating block that is in a ventilated oven set at 175°C. The samples are kept in the oven for an agreed upon period. At the end of this time, the samples are removed and allowed to cool. After cooling, the samples are dissolved in toluene. The color of each aged resin solution is measured and compared to that of a solution of the corresponding unaged resin. This color increase is a measure of the (lack of) stability of the resin.

5. Significance and Use

5.1 This practice is useful for both quality control and research.

6. Apparatus and Materials

6.1 *Forced Draft Oven,* with the ventilation set at maximum capacity.

6.2 *Aluminum Block,* equipped with a control thermocouple (see Fig. 1).

6.3 *Temperature Indicator.*

6.4 *Glass Jars,* 250 mL (8 oz), with suitably lined screw cap.

NOTE 1—TFE-fluorocarbon-lined caps work well.

6.5 *Balance,* readable to at least 0.1g.

6.6 *Shaker:* used to facilitate the dissolution of the resin specimens.

6.7 *Spectrophotometer* or *Tristimulus Colorimeter.*

7. Reagents

7.1 *Reagent Grade Toluene,* or other agreed-upon solvent (for example, xylene), for dissolving resins.

8. Procedure

8.1 Weigh 10.0 ± 0.1 g of resin into each specimen jar.

8.2 Tap each jar gently to flatten the resin layer.

NOTE 2—Avoid having resin stick to the wall of the jar, since this tends to bias the results high.

[1] 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 D01.34 on Pine Chemicals and Hydrocarbon Resins.

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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.

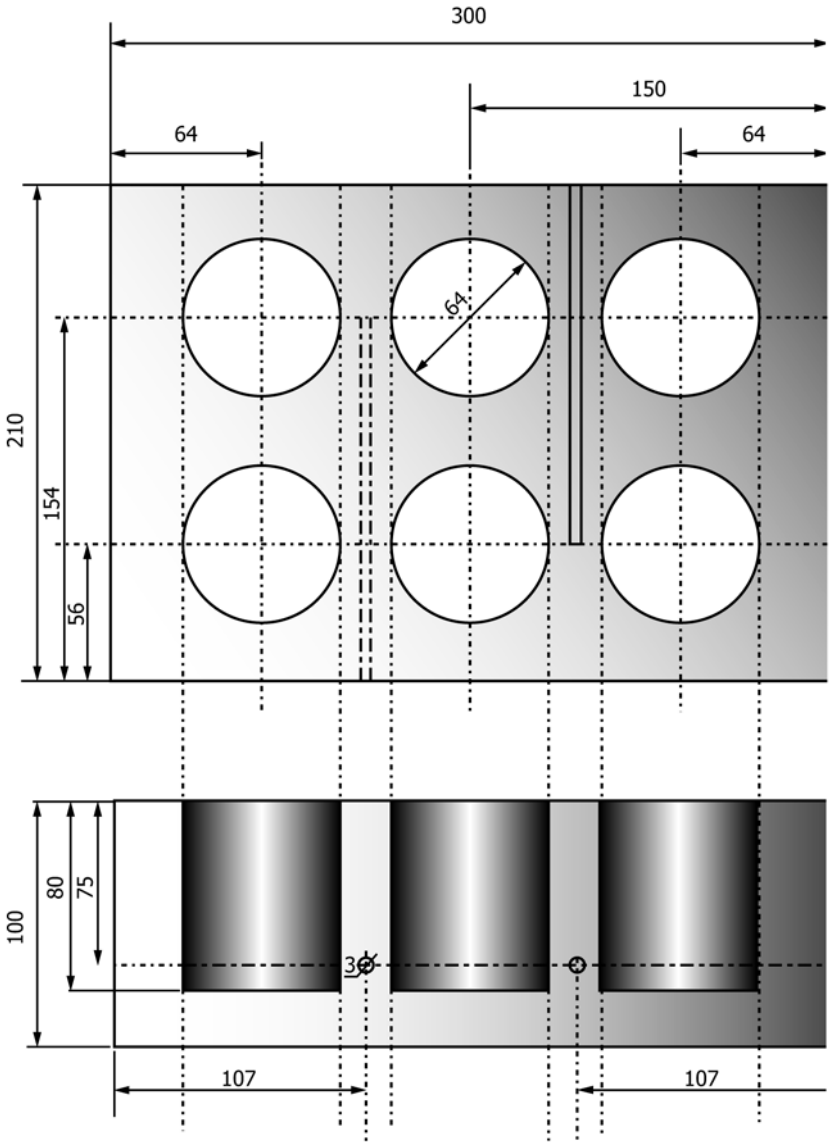

FIG. 1 Measurements in Millimetres

8.3 Install the aluminum block (see Fig. 1) in the center of an electronically regulated oven with the ventilation set at maximum.

8.4 Set the oven controls so that the control thermocouple reads 175.0°C ± 0.5°C.

8.5 **Warning**—An increase or decrease in the oven temperature from the specified temperature may alter the results.

NOTE 3—It generally takes about 4 h to stabilize the aluminum block at 175°C, when starting from room temperature.

8.6 Place the uncapped jar(s) containing the resin(s) to be tested in the holes in the 175°C aluminum block in the oven and allow it to remain for the chosen time. A test time of 5 or 16 h is usually used, but other, agreed upon times may be used.

8.7 **Warning**—Sample contamination may cause unexpected results.

8.8 Remove the jar(s) after the desired test time, seal and allow to cool for at least 30 min. After cooling, add 10 g of toluene to each jar and close tightly. For each resin sample, to another jar add 10 ± 0.1 g of the unaged resin and 10 g of toluene; then shake the jars until the resin dissolves.

8.9 Measure tristimulus values for CIE 1931 standard observer and Illuminant C. Calculate yellowness index (YI) values in accordance with Practice E313 or calculate Gardner color values in accordance with Test Method D6166.

9. Report

9.1 Report the following information:

9.1.1 Complete identification and description of the material tested,

9.1.2 Description of the instrument used for the color measurement,

9.1.3 The color of the sample before and after the test, and

9.1.4 State the test duration, and the solvent used—if different from toluene.

10. Keywords

10.1 color stability; Gardner color; hydrocarbon resins; yellowness index, (YI)