



Standard Test Method for Color of Naval Stores and Related Products (Instrumental Determination of Gardner Color)¹

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1. Scope

1.1 This test method covers the quantitative determination of the color of clear, yellow/brown, liquid materials using color measuring instruments. The results may be invalid if other materials are used. The test uses the Gardner color scale described in Test Method D 1544. This test method applies to naval stores products including tall oil, tall oil fatty acids, rosin, and related products.

1.2 *This standard does not purport to address all of the safety concerns, if any, problems 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 1544 Test Method for Color of Transparent Liquids (Gardner Color Scale)²
- E 177 Practice for the Use of the Terms Precision and Bias in ASTM Test Methods³
- E 308 Practice for Computing the Colors of Objects by Using the CIE System³
- E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method³

3. Summary of Test Method

3.1 The color of a liquid sample is measured using an instrument capable of measuring transmitted color and reporting in Gardner colors or in a color system that can be converted to Gardner colors.

4. Significance and Use

4.1 This test method provides a more precise way of measuring Gardner color than described in Test Method D 1544. It is applicable to naval stores products having colors

from Gardner 1 to Gardner 18. The Gardner scale is not applicable to materials with colors lighter than 1 or darker than 18.

5. Apparatus

5.1 An instrument capable of measuring transmitted color and reporting the results in the Gardner color scale described in Test Method D 1544. If such an instrument is not available, one may be used which is capable of measuring transmitted color and reporting in tristimulus values or chromaticity coordinates using standard illuminant C and the 2° observer, described in Practice E 308.

5.2 *Glass Cuvets*, 10-mm path length, unless a different path length is specified by the manufacturer, or

5.3 *Glass Tubes*, clear. Standard Gardner tubes, as described in Test Method D 1544, or other glass tubes designed for a specific instrument may be used. Gardner tubes may provide less accuracy than glass cuvetts and should be used only when a decrease in accuracy is acceptable. Glass cuvetts should be used for referee situations.

6. Calibration and Standardization

6.1 Calibrate the instrument following the manufacturer's recommendations.

7. Procedure

7.1 Taking care not to touch the measurement area of the sample cell, fill a clean Gardner tube or cuvet with the material to be tested. If the material is cloudy, first filter it.

7.2 Insert the glass tube or cuvet in the instrument and measure the color, following the manufacturer's recommended procedure.

8. Report

8.1 Report the color in Gardner color units to a tenth of a Gardner unit as given by the instrument or as calculated by the method in the appendix. Note if the material was filtered.

9. Precision and Bias

9.1 *Interlaboratory Test Program*—An interlaboratory study of the color of three materials was run in 1996. Each of 13 laboratories tested each of the three materials. The design of

¹ This test method is under the jurisdiction of Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.34 on Naval Stores.

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² *Annual Book of ASTM Standards*, Vol 06.01.

³ *Annual Book of ASTM Standards*, Vol 14.02.