



Standard Test Methods for Sampling and Testing Pine Oils¹

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1. Scope

1.1 These test methods cover procedures for sampling and testing pine oils, and are applicable to both natural pine oils derived from pine stumps either by the steam and solvent process or by destructive distillation, and also to synthetic pine oils obtained by the chemical hydration of terpene hydrocarbons.

1.2 The procedures given in these test methods appear in the following order:

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Moisture	10

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 268 Guide for Sampling and Testing Volatile Solvents and Chemical Intermediates for Use in Paint and Related Coatings and Materials²
- D 803 Test Methods for Testing Tall Oil³
- D 890 Test Method for Water in Liquid Naval Stores³
- D 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)²
- D 6166 Test Method for Color of Naval Stores and Related Products (Instrumental Determination of Gardner Color)³
- D 6387 Test Methods for Composition of Turpentine and Related Terpene Products by Capillary Chromatography³

¹ These test methods are under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.34 on Naval Stores.

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² Annual Book of ASTM Standards, Vol 06.04.

³ Annual Book of ASTM Standards, Vol 06.03.

E 300 Practice for Sampling Industrial Chemicals⁴

3. Significance and Use

3.1 The testing procedures described in these test methods have been in use for many years and emphasize the physical properties of pine oil rather than its chemical composition. Test Methods D 6387 describe a capillary gas chromatography method which is suitable for determining both the major and minor components found in pine oils.

4. Sampling

4.1 Sample the material in accordance with the procedure described in Guide D 268 and Practice E 300.

5. Appearance

5.1 Examine a portion of the sample after agitation to determine its clarity and freedom from foreign matter and separated water.

6. Color

6.1 Compare the color of the sample in any suitable or designated apparatus with the accepted or specific color standard. Accepted color standards are the Gardner color scale found in Test Method D 6166 and the platinum-cobalt scale found in Test Method D 1209.

7. Specific Gravity

7.1 Determine the specific gravity at 15.6/15.6°C by any convenient method, reporting the value to the nearest 0.0005. (A pycnometer or specific gravity balance is recommended. A hydrometer should not be used, on account of errors caused by surface tension on the hydrometer stem.) Correct determinations made at any other temperature, using apparatus standardized at 15.6°C by adding to or subtracting from the observed reading 0.00080 for each degree Celsius that the temperature of the liquid is above or below 15.6°C.

8. Refractive Index

8.1 Determine the refractive index with an instrument having a resolution of ± 0.0001 at 20°C, if possible. If tested at any

⁴ Annual Book of ASTM Standards, Vol 15.05.

other temperature, correct the reading obtained to 20°C by adding or subtracting 0.00045 for each degree Celsius that the temperature at which the determination was made is, respectively, above or below 20°C.

9. Composition

9.1 Determine the component concentration of pine oil by using the referenced method (Test Methods D 6387) which employs a capillary column technology.

10. Moisture

10.1 The recommended method for measuring the moisture content of pine oil is the use of the Karl Fischer reagent and is described in Test Method D 890. This test method is more rapid and more reliable than the alternative method described in 10.2.

10.2 *Alternative Method, Distillation—*

10.2.1 The azeotropic distillation method described in the procedure section of Test Methods D 803 can be used for moisture analysis of pine oil.

NOTE 1—It is important that the flask be scrupulously clean. If it shows any white deposits (such as might be caused from attack by alkalis during previous use), the percentage of water may be erroneously high due to a slight decomposition of the terpene alcohols in the pine oil.

11. Precision and Bias

11.1 Some of the procedures described in these test methods were developed many years ago and were once used widely for the sampling and testing of pine oils. Currently these test methods are less widely used and it is not considered practical to determine the precision and bias of the individual methods at this time.

11.2 Where reference is made to other ASTM test methods, these test methods should be examined to determine their precision and bias.

12. Keywords

12.1 gas chromatography; pine oil; sampling; terpene alcohols

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