



Designation: D6387 – 19 (Reapproved 2023)

Standard Test Methods for Composition of Turpentine and Related Terpene Products by Capillary Gas Chromatography¹

This standard is issued under the fixed designation D6387; 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 These test methods describe the determination of the amounts of α -pinene, β -pinene, dipentene, terpene alcohols, and other terpene compounds in turpentine and related terpene products using capillary gas chromatography. The two methods for determining the amount of the individual terpene compounds are the “internal standard” method, which yields absolute values, and the “area percent” method, which yields relative values.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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 the standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—Overall this test method gives excellent repeatability but only moderate reproducibility. This greater than normal differential is a consequence of the variety of gas chromatography (GC) columns and other variables used by participants. These variables, coupled with the complex composition of the test products, enabled some workers to separate peaks that others reported as one peak; thus, this test method gives excellent precision within a given laboratory on a given GC. When laboratory to laboratory comparison have to be made, however, it is essential that the GC operating conditions be defined closely.

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.*

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 Pine Chemicals and Hydrocarbon Resins.

Current edition approved Oct. 1, 2023. Published October 2023. Originally approved in 1999. Last previous edition approved in 2019 as D6387 – 19. DOI: 10.1520/D6387-19R23.

2. Referenced Documents

2.1 *ASTM Standards:*²

- D13 Specification for Spirits of Turpentine
- D801 Test Methods for Sampling and Testing Dipentene
- D802 Test Methods for Sampling and Testing Pine Oils
- D804 Terminology Relating to Pine Chemicals, Including Tall Oil and Related Products
- D3009 Test Method for Composition of Turpentine by Gas Chromatography (Withdrawn 1999)³
- E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 For definitions see Terminology D804.

4. Summary of Test Method

4.1 A weighed mixture of the sample and internal standard is prepared, and an aliquot is injected into a temperature programmable capillary gas chromatograph to obtain the chromatogram. The peak areas for the compounds to be determined and also for the internal standard are measured. The percentages of the compounds present are calculated from the peak area of the compounds/internal standard, weight of internal standard/sample, and the calibration factors. Alternately, the relative concentration of the compounds may be calculated using the area percent method. For hydrocarbons, the latter quantitation method usually is adequate to use since turpentine and related terpene products contain few noneluting compounds, and the individual response factors are of a similar value. A polar or nonpolar capillary column may be used for the analysis, depending on the particular compounds requiring separation and quantitation.

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.

³ The last approved version of this historical standard is referenced on www.astm.org.