



Standard Practice for Determination of Monomeric Plasticizers in Poly (Vinyl Chloride) (PVC) by Gas Chromatography¹

This standard is issued under the fixed designation D7083; 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 provides for the separation and identification of monomeric plasticizers in poly (vinyl chloride) (PVC) compounds by gas chromatography (GC).

1.2 The text of this practice references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in Tables and Figures) shall not be considered as requirements of this standard.

1.3 Test Method [D2124](#) is an alternative infrared procedure.

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

1.5 *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.*

NOTE 1—There is no known ISO equivalent to this standard.

2. Referenced Documents

2.1 *ASTM Standards:*²

[D883 Terminology Relating to Plastics](#)

[D1600 Terminology for Abbreviated Terms Relating to Plastics](#)

[D2124 Test Method for Analysis of Components in Poly\(Vinyl Chloride\) Compounds Using an Infrared Spectrophotometric Technique](#)

[D3465 Test Method for Purity of Monomeric Plasticizers by Gas Chromatography](#)

[D7823 Test Method for Determination of Low Level, Regulated Phthalates in Poly \(Vinyl Chloride\) Plastics by](#)

[Thermal Desorption—Gas Chromatography/Mass Spectrometry](#)

[E355 Practice for Gas Chromatography Terms and Relationships](#)

[E594 Practice for Testing Flame Ionization Detectors Used in Gas or Supercritical Fluid Chromatography](#)

[IEEE/ASTM SI-10 Practice for Use of the International System of Units \(SI\), the Modernized Metric System](#)

3. Terminology

3.1 *Definitions:*

3.1.1 For definition of plastic terms used in this standard, see Terminologies [D883](#) and [D1600](#).

3.2 For units, symbols, and abbreviations used in this standard refer to Practices [E594](#), [E355](#), or [IEEE/ASTM SI-10](#).

3.3 *Abbreviations:*

3.3.1 *DOA*—Bis (2-ethylhexyl) adipate

3.3.2 *DBP*—Dibutyl phthalate

3.3.3 *DOP*—Bis (2-ethylhexyl) phthalate

3.3.4 *FTIR*—Fourier Transform Infrared Spectroscopy

3.3.5 *GC*—Gas Chromatography

3.3.6 *GC/MS*—Gas Chromatography/Mass Spectrometry

3.3.7 *GPC*—Gel Permeation Chromatography

3.3.8 *HPLC*—High Performance Liquid Chromatography

3.3.9 *PVC*—Poly (Vinyl Chloride)

3.3.10 *TCP*—Tricresyl phosphate

3.3.11 *TOP*—Tris (2-ethylhexyl) phosphate

3.3.12 *TOTM*—Trioctyl trimellitate

4. Summary of Test Method

4.1 A PVC sample is extracted in accordance with Test Method [D2124](#) and the extract residue is re-dissolved in a solvent. The resulting solution is then analyzed by GC to determine the identity of each plasticizer component. The plasticizer components are identified by retention time, or chromatographic fingerprint, or both.

5. Significance and Use

5.1 Separation and identification of plasticizer components in PVC is necessary to correlate performance properties with polymer composition. This test method provides a means of

¹ This test method is under the jurisdiction of ASTM Committee [D20](#) on Plastics and is the direct responsibility of Subcommittee [D20.70](#) on Analytical Methods.

Current edition approved May 1, 2016. Published May 2016. Originally approved in 2004. Last previous edition approved in 2010 as D7083 - 04(2010) ^{ϵ 1}. DOI: 10.1520/D7083-16.

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.