



Standard Test Method for Chlordane and Heptachlor Residues in Indoor Air¹

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1. Scope

1.1 This test method covers the sampling and analysis of indoor atmospheres for residues of chlordane and heptachlor.

1.2 This test method is based upon the collection of chlordane and heptachlor from air onto polyurethane foam (PUF) and analysis by gas chromatography coupled with electron capture detection.

1.3 This test method is applicable to concentrations of chlordane varying from 0.1 to 100 µg/m³ and heptachlor varying from 0.01 to 80.0 µg/m³ with sampling periods to collect at least 0.25 m³ of air. Detection limits will depend upon the conditions of the gas chromatography (GC) and the length of the sampling period.

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

D 1356 Terminology Relating to Sampling and Analysis of Atmospheres

D 3686 Practice for Sampling Atmospheres to Collect Organic Compound Vapors (Activated Charcoal Tube Adsorption Method)

D 3687 Practice for Analysis of Organic Compound Vapors Collected by the Activated Charcoal Tube Adsorption Method

D 4185 Practice for Measurement of Metals in Workplace Atmospheres by Atomic Absorption Spectrophotometry

D 4861 Practice for Sampling and Selection of Analytical Techniques for Pesticides and Polychlorinated Biphenyls in Air

E 355 Practice for Gas Chromatography Terms and Relationships

2.2 EPA Methods:

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, EPA 600/R-96/010b³

2.3 Other Documents:

Indoor Sampling Guidelines for Termiticides⁴

3. Terminology

3.1 Definitions:

3.1.1 Refer to Terminology **D 1356**, Practice **E 355**, and Practice **D 4861** for definitions of terms used in this test method.

3.1.2 The term “chlordane” refers to a technical-grade mixture consisting mostly of chlorinated Diels-Alder addition products of cyclopentadiene and hexachlorocyclopentadiene. The mixture consists of 50 or more compounds, 10 of which are major components **(1)**.⁵ The isomers α-(or *cis*-) and γ-(or *trans*-) chlordane, heptachlor, and *trans*-nonachlor are among these.

3.1.2.1 The terms “chlordane” and “technical” chlordane are used interchangeably.

3.1.3 Heptachlor is a single chemical compound, which may be used alone or in formulations with technical chlordane. It is also a component of technical chlordane.

4. Summary of Practice

4.1 A low-volume (1 to 5 L/min) sampler is used to collect airborne chlordane and heptachlor on a sorbent cartridge containing PUF. The method is taken from Refs. **(2)** through **(4)** and Practice **D 4861**.

4.2 Chlordane and heptachlor are extracted from the sorbent cartridge with 5 % diethyl ether in hexane and analyzed on a gas chromatograph (GC) equipped with an electron capture detector (ECD).

4.3 Because of the possibility of interfering materials having similar retention times to chlordane and heptachlor peaks, column chromatography or the use of a second chromatographic column of a different type is necessary to obtain

¹ This practice is under the jurisdiction of ASTM Committee D22 on Sampling and Analysis of Atmospheres and is the direct responsibility of Subcommittee D22.05 on Indoor Air.

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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.

³ Available from the U.S. Department of Commerce, National Technical Information Service, Port Royal Road, Springfield, VA 22161.

⁴ Available from Wood Protection Council, National Institute for Building Sciences, Washington, DC, 1987.

⁵ The boldface numbers in parentheses refer to the list of references at the end of this standard.