



Designation: D4140 – 07 (Reapproved 2013)

Standard Guide for Determining Volatile and Nonvolatile Content of Driers, Drying Oils, Naval Stores, and Solvents¹

This standard is issued under the fixed designation D4140; 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 guide is intended to aid in the selection of the proper ASTM test method for determining the volatile and nonvolatile content of driers, drying oils, naval stores, and solvents.

NOTE 1—Test methods for determining the composition of the volatile fraction are not covered by this guide.

1.2 The test methods included are as follows:

Standard	Section	ASTM Designation
Driers	5.1	D1644
Drying oils	5.2	D555 D1960
Naval stores	5.3	D233 D889 D1131
Solvents	5.4	D1353

2. Referenced Documents

2.1 *ASTM Standards*:²

D16 Terminology for Paint, Related Coatings, Materials, and Applications

D233 Test Methods of Sampling and Testing Turpentine

D555 Guide for Testing Drying Oils (Withdrawn 2007)³

D804 Terminology Relating to Pine Chemicals, Including Tall Oil and Related Products

D889 Test Method for Volatile Oil in Rosin

D1131 Test Methods of Testing Rosin Oils (Withdrawn 2003)³

D1353 Test Method for Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer, and Related Products

D1644 Test Methods for Nonvolatile Content of Varnishes

¹ This guide is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.21 on Chemical Analysis of Paints and Paint Materials.

Current edition approved June 1, 2013. Published June 2013. Originally approved in 1982. Last previous edition approved in 2007 as D4140 – 07. DOI: 10.1520/D4140-07R13.

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.

D1960 Test Method for Loss on Heating of Drying Oils (Withdrawn 2003)³

3. Terminology

3.1 *Definitions*:

3.1.1 *drier, n*—an additive that accelerates the drying of an oil, paint, printing ink, or varnish (from Terminology D16).

3.1.1.1 *Discussion*—Driers are usually metallic compositions and are available in both solid and liquid forms.

3.1.2 *drying oil, n*—an oil that possesses to a marked degree the property of readily taking up oxygen from wood chiefly of the pine species (Genus Pinus) (from Terminology D16).

3.1.3 *naval stores, n*—chemically reactive oils, resins, tars, and pitches derived from the oleoresin contained in, exuded by, or extracted from wood chiefly of the pine species (Genus Pinus) (from Terminology D804).

4. Significance and Use

4.1 The nonvolatile content of raw materials may be used to determine the total nonvolatile content (solids) of paint and related coatings. Such information may be useful to coatings producers and users for the determination of the total solids available for film formation and for the estimation of the volatile organic content.

5. Procedure

5.1 *Driers*—Most liquid driers for use in paints and varnishes are sold as solutions, so usually contain significant amounts of solvent. Use Method A in Test Methods D1644 to determine the nonvolatile content.

5.2 *Drying Oils*—Test Method D1960 covers the determination of moisture and any other material that is volatile under the conditions of the test. It is applicable to all natural drying oils. This method should be used only for gross contamination with volatile materials. It is not a true loss measure since small amounts of oxygen in the inert gas used will be absorbed by the oil, resulting in a small gain in weight that may more than offset small losses.

5.3 *Naval Stores*:

5.3.1 *Rosin*—Test Method D889 covers the determination of the volatile oil content of rosin or similar material. The oil may

*A Summary of Changes section appears at the end of this standard