



Designation: D 4140 – 82 (Reapproved 2002)

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

This standard is issued under the fixed designation D 4140; 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	D 1644
Drying oils	5.2	D 555 D 1960
Naval stores	5.3	D 233 D 889 D 1131
Solvents	5.4	D 1353

2. Referenced Documents

2.1 ASTM Standards:

- D 16 Terminology for Paint, Related Coatings, Materials, and Applications²
- D 233 Test Methods of Sampling and Testing Turpentine³
- D 555 Guide for Testing Drying Oils³
- D 804 Terminology Relating to Naval Stores, Including Tall Oil and Related Products³
- D 889 Test Method for Volatile Oil in Rosin³
- D 1131 Test Methods of Testing Rosin Oils³
- D 1353 Test Method for Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer, and Related Products⁴
- D 1644 Test Methods for Nonvolatile Content of Varnishes²
- D 1960 Test Method for Loss on Heating of Drying Oils³

3. Terminology

3.1 Definitions:

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.

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² Annual Book of ASTM Standards, Vol 06.01.

³ Annual Book of ASTM Standards, Vol 06.03.

⁴ Annual Book of ASTM Standards, Vol 06.04.

3.1.1 *drier*—a composition that accelerates the drying of oil, paint, printing ink, or varnish. Driers are usually metallic compositions and are available in both solid and liquid forms (from Terminology D 16).

3.1.2 *drying oil*—an oil that possesses to a marked degree the property of readily taking up oxygen from the air and changing to a relatively hard, tough, elastic substance when exposed in a thin film to the air (from Terminology D 16).

3.1.3 *naval stores*—chemically reactive oils, resins, tars, and pitches derived from the oleoresin contained in, exuded by, or extracted from trees chiefly of the pine species (*Genus Pinus*), or from the wood of such trees (from Terminology D 804).

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 D 1644 to determine the nonvolatile content.

5.2 *Drying Oils*—Test Method D 1960 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 D 889 covers the determination of the volatile oil content of rosin or similar material. The oil may consist of naturally occurring terpene oil or of foreign nonterpene oil resulting from incomplete removal of solvent used to extract the resin from wood or still wastes.