



# Standard Guide for Determining Volatile and Nonvolatile Content of Driers, Drying Oils, Naval Stores, and Solvents<sup>1</sup>

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 ( $\epsilon$ ) 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:<sup>2</sup>

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D555 Guide for Testing Drying Oils (Withdrawn 2007)<sup>3</sup>

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D1131 Test Methods of Testing Rosin Oils (Withdrawn 2003)<sup>3</sup>

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

<sup>1</sup> 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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<sup>2</sup> 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.

<sup>3</sup> 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D1960 Test Method for Loss on Heating of Drying Oils (Withdrawn 2003)<sup>3</sup>

## 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

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.

5.3.2 *Rosin Oils*—Test Methods **D1131**, Section 9, covers the determination of volatile matter in rosin oils. The term “rosin oil” includes the oils obtained by dry destructive distillation of rosin, with or without subsequent redistillation, and also certain compounded oils prepared from a rosin oil base.

5.3.3 *Turpentine*—Test Methods **D233**, Sections 20 through 22, cover the determination of the evaporation residue of turpentine.

5.3.4 *Other Naval Stores*—Procedures for determination of volatile and nonvolatile content of naval stores not specified in

5.3.1 through 5.3.3 should be agreed upon between the producer and the user.

5.4 *Solvents*—Test Method **D1353** covers the determination of the nonvolatile matter in volatile solvents for use in paint and related coatings and materials.

## 6. Precision

6.1 Some of the referenced ASTM standards have precision limits. Reference to the individual standards for precision statements is recommended.

## 7. Keywords

7.1 driers; drying oils; naval stores; nonvolatiles; nonvolatile contentsolvents

## SUMMARY OF CHANGES

Committee D01 has identified the location of selected changes to this standard since the last issue (D4140 - 82 (2002)) that may impact the use of this standard. (Approved July 1, 2007.)

(1) Updated definitions drier and naval stores.

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