

ASTM-D268

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Standard Guide for Sampling and Testing Volatile Solvents and Chemical Intermediates for Use in Paint and Related Coatings and Material¹

This standard is issued under the fixed designation D 268; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope *

1.1 This guide covers procedures for the sampling and testing of volatile solvents used in the manufacture of paint, lacquer, varnish, and related products. The test methods are listed in Table 1.

1.2 For specific hazard information and guidance, see Suppliers' Material Safety Data Sheet for materials listed in this guide.

1.3 *This standard does not purport to address the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

- D 13 Specification for Spirits of Turpentine²
- D 56 Test Method for Flash Point by Tag Closed Tester³
- D 86 Test Method for Distillation of Petroleum Products at Atmospheric Pressure³
- D 93 Test Methods for Flash Point by Pensky-Martens Closed Cup Tester³
- D 130 Test Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test⁴
- D 156 Test Method for Saybolt Color of Petroleum Products (Saybolt Chromometer Method)³
- D 233 Methods of Sampling and Testing Turpentine²
- D 235 Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)⁴
- D 329 Specification for Acetone⁴
- D 611 Test Method for Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents³
- D 847 Test Method for Acidity of Benzene, Toluene, Xy-

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 D01.35 on Solvents, Plasticizers, and Chemical Intermediates.

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² *Annual Book of ASTM Standards*, Vol 06.03.

³ *Annual Book of ASTM Standards*, Vol 05.01.

⁴ *Annual Book of ASTM Standards*, Vol 06.04.

TABLE 1 List of Test Methods

Test Method	Section	ASTM Method
Acidity in:		
Aromatic hydrocarbons	11	D 847
Volatile solvents	11	D 1613
Acid wash color of aromatics	23	D 848
Alcohols in ketones	18	D 2804, D 3329
Alkalinity in acetone	12	D 1614
Aromatics in mineral spirits	25	D 3257
Color, platinum cobalt scale	6	D 1209
Copper corrosion test:		
Aromatic hydrocarbons	14	D 849
Mineral spirits	14	D 130
Distillation range:		
Aromatic hydrocarbons	7	D 850
Mineral spirits, turpentine	7	D 86
Volatile organic liquids	7	D 1078
Ester value	13	D 1617
Esters, purity	13	D 3545
Flash point:		
Pensky-Martens closed cup	17	D 93
Tag closed cup	17	D 56
Tag open cup	17	D 1310
Setaflash tester	17	D 3278
Method surveys:		
Ethylene and propylene glycols	22	E 202
Methanol	21	E 346
Nonaromatics in aromatics	24	D 2360
Nonvolatile matter	8	D 1353
Odor	9	D 1296
Paraffins in aromatics	24	D 2360
Permanganate time for acetone and methanol	16	D 1363
Purity of ketones	18	D 2192, D 2804, D 3329, D 3893
E 300		
Sampling	4	E 300
Solvent power evaluation:		
Aniline point and mixed aniline point of petroleum products and hydrocarbon solvents	19	D 611
Kauri-butanol value of hydrocarbon solvents	19	D 1133
Dilution ratio in cellulose nitrate solution for active solvents, hydrocarbon diluents, and cellulose nitrates	19	D 1720
Specific gravity	5	D 891, D 2935, D 3505, D 1555
Sulfur as hydrogen sulfide and sulfur dioxide	15	D 853
Water:		
Fischer reagent titration method	10	D 1364, E 203
Turbidity method	10	D 1476
Water miscibility of water-soluble solvents	20	D 1722

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

lenes, Solvent Naphthas, and Similar Industrial Aromatic Hydrocarbons⁴

D 848 Test Method for Acid Wash Color of Industrial Aromatic Hydrocarbons⁴

D 849 Test Method for Copper Strip Corrosion of Industrial Aromatic Hydrocarbons⁴

D 850 Test Method for Distillation of Industrial Aromatic Hydrocarbons and Related Materials⁴

D 853 Test Method for Hydrogen Sulfide and Sulfur Dioxide Content (Qualitative) of Industrial Aromatic Hydrocarbons⁴

D 891 Test Methods for Specific Gravity, Apparent, of Liquid Industrial Chemicals⁵

D 1078 Test Method for Distillation Range of Volatile Organic Liquids⁴

D 1133 Test Method for Kauri-Butanol Value of Hydrocarbon Solvents⁴

D 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)⁴

D 1296 Test Method for Odor of Volatile Solvents and Diluents⁴

D 1310 Test Method for Flash Point and Fire Point of Liquids by Tag Open-Cup Apparatus⁶

D 1353 Test Method for Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer, and Related Products⁴

D 1363 Test Method for Permanganate Time of Acetone and Methanol⁴

D 1364 Test Method for Water in Volatile Solvents (Karl Fischer Reagent Titration Method)⁴

D 1476 Test Method for Heptane Miscibility of Lacquer Solvents⁴

D 1555 Test Method for Calculation of Volume and Weight of Industrial Aromatic Hydrocarbons⁴

D 1613 Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products⁴

D 1614 Test Method for Alkalinity in Acetone⁴

D 1617 Test Method for Ester Value of Solvents and Thinners⁴

D 1720 Test Method for Dilution Ratio of Active Solvents in Cellulose Nitrate Solutions⁴

D 1722 Test Method for Water Miscibility of Water-Soluble Solvents⁴

D 2192 Test Method for Purity of Aldehydes and Ketones⁴

D 2360 Test Method for Trace Impurities in Monocyclic Aromatic Hydrocarbons by Gas Chromatography⁴

D 2804 Test Method for Purity of Methyl Ethyl Ketone by Gas Chromatography⁴

D 2935 Test Method for Apparent Density of Industrial Aromatic Hydrocarbons⁴

D 3257 Test Methods for Aromatics in Mineral Spirits by Gas Chromatography⁴

D 3278 Test Method for Flash Point of Liquids by Small Scale Closed-Cup Apparatus⁶

D 3329 Test Method for Purity of Methyl Isobutyl Ketone by Gas Chromatography⁴

D 3505 Test Method for Density or Relative Density of Pure Liquid Chemicals⁴

D 3545 Test Method for Alcohol Content and Purity of Acetate Esters by Gas Chromatography⁴

D 3893 Test Method for Purity of Methyl Amyl Ketone and Methyl Isoamyl Ketone by Gas Chromatography⁴

E 12 Terminology Relating to Density and Specific Gravity of Solids, Liquids, and Gases⁵

E 201 Test Method for Calculation of Volume and Weight of Industrial Chemical Liquids⁵

E 202 Test Methods for Analysis of Ethylene Glycols and Propylene Glycols⁵

E 203 Test Method for Water Using Karl Fischer Reagent⁵

E 300 Practice for Sampling Industrial Chemicals⁵

E 346 Method for Analysis of Methanol⁵

3. Significance and Use

3.1 A brief discussion of each test method is given with the intent of helping the user in the selection of the most applicable procedure where more than one is available.

4. Sampling

4.1 Representative samples are a prerequisite for the evaluation of any product. The directions for obtaining representative samples cannot be made explicit to cover all cases and must be supplemented by judgment, skill, and sampling experience. It is recommended that Practice E 300 be employed in sampling liquid solvents.

5. Specific Gravity

5.1 Specific gravity of liquids is defined in Terminology E 12 as “the ratio of the mass of a unit volume of a material to the mass of the same volume of gas-free distilled water at a stated temperature.” When the stated temperature of the water is 4.0°C, specific gravity and density are numerically equal.

5.2 The apparent specific gravity of liquid is defined in Terminology E 12 as “the ratio of the weight in air of a unit volume of material at a stated temperature to the weight in air of equal density of an equal volume of gas-free, distilled water at a stated temperature.”

NOTE 1—Specific gravity or density is an intrinsic property of all substances and can to a degree be used to identify them. When such substances are of high purity, specific gravity may be used in support of other properties to define their degree of purity. The use of specific gravity for such purposes, however, is valid only when all components and their relative effects upon the specific gravity of the system are known.

5.3 The choice of test method for determining specific gravity is largely dependent on the degree of accuracy required. In general, when the product specification requires an accuracy to the third decimal place, the hydrometer or specific gravity balance method may be employed. When the product specification requires an accuracy to the fourth decimal place, a pycnometer method should be employed. Test Methods D 891 give procedures using all three techniques.

5.4 With specific reference to the determination of density or specific gravity of a number of aromatic and cyclic hydrocarbon solvents, Test Method D 3505 describes a simplified procedure for this measurement.

⁵ Annual Book of ASTM Standards, Vol 15.05.

⁶ Annual Book of ASTM Standards, Vol 06.01.