



Standard Practices for Testing Alkyd Resins¹

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1. Scope

1.1 These practices cover test methods for testing alkyd resins as listed in Table 1. They are the test methods most often used to characterize alkyds. All of the analytical test methods were subjected to interlaboratory testing using oil-modified alkyds. Their adaptability to other types of alkyds has not been studied. Although each test method specifies a recommended amount of specimen for starting a separate analysis, several of the procedures can be conducted on the same starting specimen, if desired. For example, the tests for unsaponifiable matter, fatty acid content, oil identification, and phthalic acid content could all be run on a consecutive basis, if all were required.

2. Referenced Documents

2.1 ASTM Standards:

- D 93 Test Methods for Flash Point by Pensky-Martens Closed Tester²
- D 563 Test Method for Phthalic Anhydride Content of Alkyd Resins and Resin Solutions³
- D 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)⁴
- D 1259 Test Methods for Nonvolatile Content of Resin Solutions⁵
- D 1306 Test Method for Phthalic Anhydride Content of Alkyd Resins and Esters Containing Other Dibasic Acids (Gravimetric)³
- D 1397 Test Method for Unsaponifiable Matter in Alkyd Resins and Resin Solutions³
- D 1398 Test Method for Fatty Acid Content of Alkyd Resins and Alkyd Resin Solutions³
- D 1475 Test Method for Density of Paint, Varnish, Lacquer, and Related Products⁵
- D 1544 Test Method for Color of Transparent Liquids (Gardner Color Scale)⁵
- D 1545 Test Method for Viscosity of Transparent Liquids by Bubble Time Method³

¹ These practices are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.33 on Polymers and Resins.

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² Annual Book of ASTM Standards, Vol 05.01.

³ Annual Book of ASTM Standards, Vol 06.03.

⁴ Annual Book of ASTM Standards, Vol 06.04.

⁵ Annual Book of ASTM Standards, Vol 06.01.

TABLE 1 Test Methods for Testing Alkyd Resins

Test Method	Section	ASTM Designation
Nonvolatile content	4 D 1259	
Acid value	5	D 1639
Unsaponifiable matter	6	D 1397
Fatty acid content	7	D 1398
Identification of oils and acids	8	D 2245
Phthalic anhydride content	9	D 563
		D 1306
Isophthalic acid content	10	D 2690
Polyhydric alcohol content	11	D 2998
Identification of carboxylic acids	12	D 2455
Flash point	13	D 93
		D 3278
Color	14	D 1209
		D 1544
Density	15	D 1475
Viscosity	16	D 1545
Clarity	17	D 2090

D 1639 Test Method for Acid Value of Organic Coating Materials³

D 2090 Test Method for Clarity and Cleanness of Paint and Ink Liquids³

D 2245 Test Method for Identification of Oils and Oil Acids in Solvent-Reducible Paints⁵

D 2455 Test Method for Identification of Carboxylic Acids in Alkyd Resins³

D 2690 Test Method for Isophthalic Acid in Alkyd and Polyester Resins³

D 2998 Test Method for Polyhydric Alcohols in Alkyd Resins³

D 3278 Test Methods for Flash Point of Liquids by Set-aflash Closed-Cup Apparatus⁵

3. Significance and Use

3.1 These practices should be used as a reference for any alkyd resin analyst who wants general information about classifying alkyd resins. In each case, the significance and use of the specific classification item will be found in the referenced test method.⁶

4. Nonvolatile Content

4.1 A unique test method for determining nonvolatile matter in solutions of alkyd resins in volatile organic solvents provides for the drying of very thin films of resin quickly, thus

⁶ Annual Book of ASTM Standards, Vols 06.02 and 06.03.