



Designation: D 4302 – 99

## Standard Specification for Artists' Oil, Resin-Oil, and Alkyd Paints<sup>1</sup>

This standard is issued under the fixed designation D 4302; 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 specification establishes requirements for composition, physical properties, performance, and labeling of artists' oil, resin-oil, and alkyd paints.

1.2 This specification covers pigments, vehicles, and additives. Requirements are included for pigment identification, lightfastness, consistency, and drying time.

1.3 Table 1 lists some pigments meeting the lightfastness requirements in this specification. In order to identify other pigments that meet these requirements, instructions are given for test specimen preparation. Test methods for determining relative lightfastness are referenced.

1.4 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 This pertains only to the test method found in Section 8. *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

### 2. Referenced Documents

#### 2.1 ASTM Standards:

- D 79 Specification for Zinc Oxide Pigments<sup>2</sup>
- D 185 Test Methods for Coarse Particles in Pigments, Pastes, and Paints<sup>2</sup>
- D 387 Test Method for Color and Strength of Color Pigments with a Mechanical Muller<sup>3</sup>
- D 476 Specification for Titanium Dioxide Pigments<sup>2</sup>
- D 602 Specification for Barium Sulfate Pigments<sup>2</sup>
- D 1133 Test Method for Kauri-Butanol Value of Hydrocarbon Solvents<sup>4</sup>
- D 1210 Test Method for Fineness of Dispersion of Pigment-Vehicle Systems by Hegman-Type Gage<sup>3</sup>
- D 1640 Test Methods for Drying, Curing, or Film Forma-

tion of Organic Coatings at Room Temperature<sup>3</sup>

D 1729 Practice for Visual Evaluation of Color Differences of Opaque Materials<sup>3</sup>

D 2244 Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates<sup>3</sup>

D 2245 Test Method for Identification of Oils and Oil Acids in Solvent-Reducible Paints<sup>3</sup>

D 2369 Test Method for Volatile Content of Coatings<sup>3</sup>

D 2689 Practices for Testing Alkyd Resins<sup>2</sup>

D 4236 Practice for Labeling Art Materials for Chronic Health Hazards<sup>5</sup>

D 4303 Test Methods for Lightfastness of Pigments Used in Artists' Paints<sup>5</sup>

D 4838 Test Method for Determining the Relative Tinting Strength of Chromatic Paints<sup>5</sup>

D 4941 Practice for Preparing Drawdowns of Artists' Paste Paints<sup>5</sup>

E 284 Terminology of Appearance<sup>3</sup>

### 3. Terminology

#### 3.1 Definitions:

3.1.1 *Colour Index Name*—consists of the category (type of dye or pigment), general hue, and an assigned number given to a colorant in the Colour Index<sup>6</sup> as an international identification system.

3.1.1.1 *Discussion*—For example, the Colour Index Name of one phthalocyanine blue pigment is Pigment Blue 15 (PB 15).

3.1.2 *Colour Index Number*—a five-digit number given in the Colour Index that describes the chemical constitution of a colorant.

3.1.2.1 *Discussion*—For example, the Colour Index Number of one phthalocyanine blue pigment is 74160.

3.1.3 Refer to Terminology E 284 for appearance terms used in this specification.

#### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *alkali refined oil*—triglyceride oil of vegetable origin that has been treated with alkali to reduce the free acidity by formation of water-soluble salts, subsequently removed by washing.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.57 on Artist Paints and Related Materials.

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<sup>2</sup> Annual Book of ASTM Standards, Vol 06.03.

<sup>3</sup> Annual Book of ASTM Standards, Vol 06.01.

<sup>4</sup> Annual Book of ASTM Standards, Vol 06.04.

<sup>5</sup> Annual Book of ASTM Standards, Vol 06.02.

<sup>6</sup> Colour Index, 3rd ed., 5 Vols and Revisions, The Society of Dyers and Colourists, London, 1971–75. Available from the American Association of Textile Chemists and Colorists, P. O. Box 12215, Research Triangle Park, NC 27709.

3.2.1.1 *Discussion*—An appreciable degree of free acidity may cause a greater development of yellowing in a dried film of oil. Most artists' oil paints are ground in alkali refined oil.

3.2.2 *alkyd paint*—paint containing a resin produced by combining a polybasic acid, a polyhydric alcohol, and the fatty acid of a drying vegetable oil. For this specification, the resin produced must be soluble in mineral spirits or turpentine.

3.2.3 *drier (siccative)*—a substance, usually an organometallic compound, that accelerates the rate of drying of an oil paint or oil medium.

3.2.4 *oil paint*—paint containing an alkali refined triglyceride drying oil of vegetable origin.

3.2.5 *resin-oil paint*—paint containing 90 weight % minimum of vehicle solids, vegetable drying oil, and 10 weight % maximum of vehicle solids replaced by gum or resin.

#### 4. Significance and Use

4.1 This specification establishes quality requirements and provides a basis for common understanding among producers, distributors, and users.

4.2 It is not intended that all paints meeting the requirements be identical nor of uniform excellence in all respects. Variations in manufacture, not covered by this specification, may cause some artists to prefer one brand over another, either of which may be acceptable under this specification.

#### 5. Labeling Requirements

##### 5.1 *Pigment(s) Identification:*

5.1.1 Every label shall include for each pigment contained in the paint (1) the information underlined in Table 1 (which includes the Common Name, Colour Index Name, and any additional terms necessary to identify the form of the pigment) and (2) the appropriate Lightfastness Category.

5.1.2 The complete pigment identification given in Table 1, which also includes the Colour Index Number and a simple chemical description, shall be given in an appropriate producer publication. Manufacturers are encouraged to put this complete identification on the container label when label size permits.

5.1.3 The Common Name shall be placed on the front of the label and shall be the name of the paint except as described in 5.1.5 and 5.1.6. Other identification may be placed elsewhere on the container.

5.1.4 The Colour Index name may be spelled out in full or abbreviated depending on the size of the label. Example: Pigment Blue 15, or Pig. Blue 15 or PB 15.

5.1.5 *Substituted Pigment*—In the case of substituted pigments, the word "Hue" in equal size letters shall follow in the title, on the front of the tube, immediately after the name of the pigment that has been simulated. Directly below the title, the Common Name from Table 1 of the pigment(s) used shall be given in letters no less than the next type size smaller than the title; or if more than one pigment is used, then 5.1.7 covering mixed pigments, can be followed. For example:

CADMIUM RED MEDIUM HUE	COBALT BLUE HUE
(Naphthol Red AS-OL)	(Mixture)

5.1.6 Proprietary names or optional names may be used provided the Common Name(s) given in Table 1 appears on the front of the label directly under the proprietary or optional name in letters no less than the next type size smaller than the

proprietary or optional name; or if more than one pigment is used, then 5.1.7 covering mixed pigments, can be followed.

5.1.7 *Mixed Pigments*—Artists' paints containing more than one pigment comply with this specification if all colored pigments included in the mixture are on the suitable pigment list (Table 1) and provided the mixture itself has passed all other test requirements in this specification. The Common Names for the pigments in the mixture, or the word "Mixture," must appear under the title in letters no less than the next type size smaller than the title. For example:

PERMANENT GREEN LIGHT	PERMANENT GREEN LIGHT
(Cadmium Yellow Light, Phthalocyanine Blue)	(Mixture)

If the word "Mixture" is used under the title, the Common Names of the pigments in the mixture, as given in Table 1, must be listed along with their Colour Index Names and the Lightfastness Category of the mixture somewhere on the label. The lightfastness category shall be that of the least lightfast pigment. This lightfastness category may be changed if the mixture is tested for lightfastness in accordance with Test Methods D 4303 and results indicating a different category are submitted to ASTM Subcommittee D01.57 for evaluation.

5.2 Provide on the label:

5.2.1 *Artists' Oil Paints*—Vegetable origin of the oil and method of refinement.

NOTE 1—The type of oil can be identified in accordance with Test Method D 2245.

5.2.2 *Artists' Alkyd Paints*—Type of fatty acid used. If free vegetable oil is used in combination with an alkyd resin, declare this also on the label. State if compatible with artists' oil paints.

NOTE 2—The type of alkyd can be identified in accordance with Practices D 2689.

5.2.3 *Artists' Resin-Oil Paints*—Vegetable origin and method of refinement of the oil and type of resin or gum. If the colors in a resin-oil paint line contain more than one, or different, gums or resins, the identification on the individual labels may uniformly include all of the gums or resins used in the paint line. Example: "Damar or Mastic Gum." State if compatible with artists' oil paints.

NOTE 3—The type of oil can be identified in accordance with Test Method D 2245.

5.3 *Lightfastness*—The label shall contain the word "Lightfastness" followed by the appropriate rating, I or II, as given for each pigment in Table 1.

5.3.1 Lightfastness I pigments, when made into paint specimens as described in Section 8 and exposed, tested, and rated in accordance with Test Methods D 4303, shall have a color difference ( $\Delta E^*_{ab}$ ) of 4 or less CIELAB units between the specimens measured before and after exposure.

5.3.2 Lightfastness II pigments, when made into paint specimens as described in Section 8 and exposed, tested, and rated in accordance with Test Methods D 4303, shall have a color difference ( $\Delta E^*_{ab}$ ) of more than 4.0 but not more than 8.0 CIELAB units between the specimens measured before and after exposure.