



Designation: D4302 – 05(Reapproved 2010)

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

This standard is issued under the fixed designation D4302; 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 SI units are to be regarded as 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:<sup>2</sup>

- D79 Specification for Zinc Oxide Pigments
- D185 Test Methods for Coarse Particles in Pigments
- D387 Test Method for Color and Strength of Chromatic Pigments with a Mechanical Muller
- D476 Classification for Dry Pigmentary Titanium Dioxide Products
- D602 Specification for Barium Sulfate Pigments
- D1133 Test Method for Kauri-Butanol Value of Hydrocarbon Solvents

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

Current edition approved Dec. 1, 2010. Published December 2010. Originally approved in 1983. Last previous edition approved in 2005 as D4302 – 05. DOI: 10.1520/D4302-05R10.

<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.

- D1210 Test Method for Fineness of Dispersion of Pigment-Vehicle Systems by Hegman-Type Gage
- D1640 Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature
- D1729 Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials
- D2244 Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
- D2245 Test Method for Identification of Oils and Oil Acids in Solvent-Reducible Paints
- D2369 Test Method for Volatile Content of Coatings
- D2689 Practices for Testing Alkyd Resins (Withdrawn 2008)<sup>3</sup>
- D4236 Practice for Labeling Art Materials for Chronic Health Hazards
- D4303 Test Methods for Lightfastness of Colorants Used in Artists' Materials
- D4838 Test Method for Determining the Relative Tinting Strength of Chromatic Paints
- D4941 Practice for Preparing Drawdowns of Artists' Paste Paints
- E284 Terminology of Appearance

### 3. Terminology

#### 3.1 Definitions:

3.1.1 *Colour Index Name, n*—consists of the category (type of dye or pigment), general hue, and an assigned number given to a colorant in the Colour Index<sup>4</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, n*—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.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

<sup>4</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.

**TABLE 1 Suitable Pigments List**

NOTE 1—Underlined information and the lightfastness rating in the table shall be included on every label.

NOTE 2—The chemical classes in **Table 1** have been revised to more closely conform to recommended terminology. When relabeling or publishing literature, the chemical classes given in **Table 1** should be used; however, product labels or literature using the chemical descriptions given in Table 1 of D4302–96a are still in conformance with this specification.

**Key:**

**Lightfastness Category:**

Lightfastness I Excellent Lightfastness

Lightfastness II Very Good Lightfastness

**Abbreviations Used in Colour Index Names:**

NR Natural Red  
PB Pigment Blue  
PBk Pigment Black  
PBr Pigment Brown  
PG Pigment Green  
PO Pigment Orange  
PR Pigment Red  
PV Pigment Violet  
PW Pigment White  
PY Pigment Yellow

**Pigment Notations:**

(BS) Blue shade  
(CC) Concentrated cadmium pigments may contain up to 15 % barium sulfate for color control. Cadmium-barium pigments contain a much higher amount of barium sulfate.  
(DL) May darken in strong light  
(LF) Lightfast type  
(NA) Colour index name or number not assigned  
... Not tested  
(RS) Red shade  
(SM) Sensitive to moisture in direct sunlight  
(SS) Sensitive to hydrogen sulfide

Colour Index Name	Lightfastness Category		Common Name and Chemical Class	Colour Index Number
	Oil and Resin-Oil	Alkyd		
YELLOWS				
PY 3	II	II	Arylide Yellow 10G, with option of adding the name Hansa Yellow Light, Organic: monoazo, acetoacetyl, 10G	11710
PY 35	I	...	Cadmium (hue designation), Inorganic: cadmium zinc sulfide (CC) (SM)	77205
PY 35:1	I	...	Cadmium-Barium (hue designation), Inorganic: cadmium zinc sulfide coprecipitated with barium sulfate (SM)	77205:1
PY 37	I	I	Cadmium (hue designation), Inorganic: cadmium sulfide (CC) (SM)	77199
PY 37:1	I	...	Cadmium-Barium (hue designation), Inorganic: cadmium sulfide coprecipitated with barium sulfate (SM)	77199:1
PY 40	II	...	Aureolin, or Cobalt Yellow, Inorganic: potassium cobaltinitrite	77357
PY 41	I	...	Naples Yellow, Inorganic: lead antimonate (SS)	77589
PY 42	I	...	Mars Yellow or Iron Oxide Yellow, Inorganic: synthetic hydrated iron oxide	77492
PY 42	I	...	Mars Orange or Iron Oxide Orange, Inorganic: synthetic hydrated iron oxide	77492
PY 43	I	I	Yellow Ochre, Inorganic: natural hydrated iron oxide	77492
PY 53	I	...	Nickel Titanate Yellow, Inorganic: oxides of nickel, antimony and titanium	77788
PY 65	I	...	Arylide Yellow RN, with option of adding the name Hansa Yellow RN, Organic: monoazo, acetoacetyl RN	11740
PY 73	I	...	Arylide Yellow GX, with option of adding the name Hansa Yellow GX, Organic: monoazo, acetoacetyl, GX	11738
PY 74(LF)	I	...	Arylide Yellow 5GX, with option of adding the name Hansa Yellow 5GX, Organic: monoazo: acetoacetyl 5GX	11741
PY 83 HR 70	I	...	Diarylide Yellow HR70, Organic: disazo, HR 70	21108
PY 97	I	...	Arylide Yellow FGL, Organic: monoazo, acetoacetyl FGL	11767
PY 98	II	...	Arylide Yellow 10GX, with the option of adding the name Hansa Yellow 10GX, Organic: monoazo, acetoacetyl, 10GX	11727
PY 108	I	...	Anthrapyrimidine Yellow, Organic: anthraquinone	68420
PY 109	I	...	Isoidolinone Yellow G, Organic: aminoketone, G tetrachloroisindolinone	56284
PY 110	I	...	Isoidolinone Yellow R, Organic: aminoketone, R tetrachloroisindolinone	56280
PY 112	I	...	Flavanthrone Yellow, Organic: anthraquinone	70600
PY 129	I	...	Azomethine Yellow 56, Organic: methine, 5G copper complex of azomethine	48042
PY 138	I	...	Quinophthalone Yellow, Organic: aminoketone, quinophthalone	56300
PY 139	I	...	Isoidoline Yellow, Organic: aminoketone, isoidoline	56298
PY 150	I	...	Nickel Azo Yellow, Organic: monoazo, heterocyclic hydroxy, nickel complex	12764
PY 151	I	...	Benzimidazolone (hue designation) H4G, Organic: monoazo, acetoacetyl, H4G	13980
PY 153	I	...	Nickel Dioxine Yellow, Organic: methine, dioximer, nickel complex	48545
PY 154	I	...	Benzimidazolone (hue designation) H3G, Organic: monoazo, acetoacetyl, H3G	11781
PY 175	I	...	Benzimidazolone (hue designation) H6G, Organic: monoazo, acetoacetyl, H6G	11784
ORANGES				
PO 5	II	...	Dinitraniline Orange, Organic: monoazo, acetoacetyl (SM)	12075
PO 20	I	I	Cadmium (hue designation), Inorganic: cadmium sulfo-selenide (CC)	77202
PO 20:1	I	...	Cadmium-Barium (hue designation), Inorganic: cadmium sulfoselenide coprecipitated with barium sulfate	77202:1
PO 23	I	...	Cadmium Vermilion Orange, Inorganic: cadmium mercury sulfide (CC)	77201
PO 23:1	I	...	Cadmium-Barium Vermilion Orange, Inorganic: cadmium mercury sulfide coprecipitated with barium sulfate	77201:1
PO 36	I	...	Benzimidazolone (hue designation) HL, Organic: monoazo, acetoacetyl, HL	11780