



Designation: D 4890 – 98

Standard Test Methods for Polyurethane Raw Materials: Determination of Gardner and APHA Color of Polyols¹

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1. Scope

1.1 These test methods measure visually the color of clear polyester and polyether liquids. They apply only to materials whose colors have light-absorption characteristics similar to those of the standards. An alternative method is Test Method D 1209. (See Note 1.)

1.2 *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.*

NOTE 1—Although Test Method A of these test methods and ISO 4630-1997 differ in some details, data obtained using either are technically equivalent. Although Test Method B of these test methods and ISO 6271-1981 differ in some details, data obtained using either are technically equivalent.

2. Referenced Documents

2.1 ASTM Standards:

- D 883 Terminology Relating to Plastics²
- D 1193 Specification for Reagent Water³
- D 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)⁴
- D 5386 Test Method for Color of Liquids Using Tristimulus Colorimetry⁵
- E 308 Practice for Computing the Colors of Objects by Using the CIE System⁵
- E 1164 Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation⁵

2.2 ISO Standards:

ISO 4630-1997 Binders for Paints and Varnishes—

Estimation of Color of Clear Liquids by the Color Scale⁶
ISO 6271-1981 Clear Liquids—Estimation of Color by the
Platinum-Cobalt Scale⁶

3. Terminology

3.1 For definitions of terms used in these test methods see Terminology D 883.

4. Summary of Test Method

4.1 In Test Method A, the color of the material to be tested is compared to a series of color standards with defined chromicity coordinates, prepared on one of three ways. The results are reported as the color standard, which best matches the sample.

4.2 In Test Method B, the color of the material to be tested is compared to a series of platinum-cobalt color standards, designated by mg of Pt/mL of standard solution. The results are reported as the color standard, which best matches the sample (Note 2).

NOTE 2—Color of liquids also can be measured by visible spectroscopy and the results converted to any of several color scales. These results can be converted to the APHA scale by appropriate manipulations, as for example in Test Method D 5386.

5. Significance and Use

5.1 These test methods are suitable for quality control, as specification tests, and for research. Color is an important property of urethane products.

6. Sampling

6.1 Polyesters and polyethers usually contain molecules covering an appreciable range of molecular weights. These have a tendency to fractionate during solidification. Unless the material is a liquid or finely ground solid it is necessary to melt (using no higher temperature than necessary) and mix the resin well before removing a sample for analysis. Many polyols are hygroscopic and care should be taken to provide minimum exposure to atmospheric moisture during the sampling.

¹ These test methods are under the jurisdiction of Committee D-20 on Plastics and are the direct responsibility of Subcommittee D20.22 on Cellular Plastics.

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² Annual Book of ASTM Standards, Vol 08.01.

³ Annual Book of ASTM Standards, Vol 11.01.

⁴ Annual Book of ASTM Standards, Vol 06.04.

⁵ Annual Book of ASTM Standards, Vol 14.02.

⁶ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.