



Designation: D2851 – 15

Standard Specification for Liquid Optical Adhesive¹

This standard is issued under the fixed designation D2851; 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 covers liquid optical adhesive for use in bonding glass to glass or other transparent adherends.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses are provided for information purposes only.

1.3 The following precautionary caveat pertains only to the test method portion, Section 6, of this specification: *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.* Specific precautionary statements are given in 6.1.1.

2. Referenced Documents

2.1 *ASTM Standards*:²

D542 Test Method for Index of Refraction of Transparent Organic Plastics

D897 Test Method for Tensile Properties of Adhesive Bonds

D904 Practice for Exposure of Adhesive Specimens to Artificial Light

D907 Terminology of Adhesives

D1084 Test Methods for Viscosity of Adhesives

E308 Practice for Computing the Colors of Objects by Using the CIE System

E1953 Practice for Description of Thermal Analysis and Rheology Apparatus

3. Terminology

3.1 *Definitions*—Many terms in this specification are defined in Terminology D907.

¹ This specification is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.60 on Adhesive Material Classification System.

Current edition approved Sept. 1, 2015. Published September 2015. Originally approved in 1970. Last previous edition approved in 2015 as D2851 – 98 (2015). DOI: 10.1520/D2851-15.

² 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.

4. Significance and Use

4.1 The bond strength tests provide reasonably accurate information with regard to the bond strength of the adhesives. Bond strength data may be suitable for specification acceptance, service evaluation, manufacturing control, research, and development. Bond strength tests are not considered significant for applications differing widely from the test in rate and type of loading.

5. General Requirements

5.1 The adhesive shall be in liquid form and free of solvent in order to avoid bubble formation in the adhesive layer. Each component shall be completely reactive (without residual volatile products). The adhesive may be heat-, catalyst-, or radiation-cured.

5.1.1 *Volatility*—Volatile content of the adhesive shall not exceed 0.5 %, unless otherwise agreed upon between the manufacturer and the purchaser.

5.1.2 *Viscosity*—The viscosity of the adhesive shall be within a well-defined range as agreed upon between the manufacturer and the purchaser.

5.1.3 *Color*—The color of the adhesive shall not exceed the color of a platinum-cobalt standard solution No. 300.

5.1.4 *Cleanliness*—The number and size of foreign particles found in 100 mL of the adhesive shall not exceed 5 particles in the size range from 10 to 100 μm (0.1 mm), and none larger than 100 μm . The number and size of foreign particles in the catalyst required to cure 100 mL of the adhesive shall not exceed 2 particles in the size range from 10 to 100 μm , and none larger than 100 μm .

5.1.5 *Refractive Index*—The refractive index of the cured adhesive shall be within a well-defined range as agreed upon between the manufacturer and the purchaser.

5.1.6 *Stability*—The liquid adhesive shall not change in viscosity by greater than 20 % of its original viscosity nor show any formation of solids, when tested as described in 6.6.

5.1.7 *Light Transmission*—Visible light transmission through a bonded glass doublet (two glass disks bonded as described in 6.8) shall not be less than 98.5 % of the total light transmitted through a single glass disk. There shall be no change in light transmission of a glass doublet after the environmental test (see 6.9).

5.1.8 *Environmental Test*—Separation within the adhesive layer or from either glass surface of the glass doublet shall not