



Standard Specification for Light Source Products for Inspection of Fluorescent Coatings¹

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1. Scope

1.1 This specification provides the requirements for light source products intended for excitation of fluorescent materials used as a system for detection of defects in industrial coatings. This includes the examination of both longer wavelength fluorescing primer coatings as well as non-fluorescent top coatings.

1.2 This specification establishes the radiometric requirements of the light source product in terms of required wavelength range and minimum irradiance.

1.3 This specification establishes safety requirements for the light source product necessary to ensure the product will not pose a threat to visual health.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *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:*²

E 284 Terminology of Appearance

E 1341 Practice for Obtaining Spectroradiometric Data from Radiant Sources for Colorimetry

G 138 Test Method for Calibration of a Spectroradiometer Using a Standard Source of Irradiance

¹ This specification is under the jurisdiction of ASTM Committee E12 on Color and Appearance and is the direct responsibility of Subcommittee E12.05 on Fluorescence.

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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.

2.2 *IEC Standards:*³

IEC 60825-1 Edition 1.2 Safety of Laser Products – Part 1: Equipment classification, requirements and user's guide.

3. Terminology

3.1 *Definitions:* The definitions of terms in Terminology **E 284** are applicable to this standard.

4. Significance and Use

4.1 Light source products conforming to this specification are intended to be used in conjunction with coatings specially formulated with fluorescent colorants as a system for the visual detection of defects in industrial protective coatings.

4.2 Visible fluorescence from the coating enhances the visibility of coating irregularities and defects and is produced by excitation of visible-activated fluorescent colorants in the coating.

4.3 Light source products with defined wavelength and intensity properties are required to produce adequate visible fluorescence for easy visual location of defects.

4.4 A light source product is considered to consist of a light source component incorporated into an optical, electrical, mechanical, and power supply system that makes it suitable for use in an industrial environment. The entire light source product is subject to this standard. The light source component and any subassemblies of the light source product are not subject to this standard.

4.5 This specification is limited to light source products providing excitation in the range from 400 to 420 nm.

5. Performance Requirements

5.1 *Irradiance:*

5.1.1 The light source shall provide a minimum irradiance of 15 W/m² at 10 cm distance from the point at which the light exits the product.

³ Available from International Electrotechnical Commission (IEC), 3, rue de Varembé, Case postale 131, CH-1211, Geneva 20, Switzerland.

5.1.2 Ninety-five percent (95 %) of the output flux shall be of a wavelength in the range from 380 to 435 nm.

5.2 *Eye Safety*—The device must conform to the requirements of a Class 1 or Class 2 LED product as set out in IEC 60825-1.

6. Test Method

6.1 Irradiance for Section 5.1:

6.1.1 Measure the light source in an environment with ambient temperature between 20 and 25°C. Store the light source and its batteries for a minimum of 4 h in this environment before turning it on.

6.1.2 Turn on the light source and allow it to operate continuously for 30 min before measuring irradiance to allow the light source to approach a steady state operating temperature and for fresh batteries to discharge beyond high voltage startup conditions.

6.1.3 Measure irradiance using a spectroradiometer calibrated, verified, operated in accordance with Test Method G 138 and Practice E 1341.

6.1.4 Report irradiance results in accordance with Practice E 1341.

6.1.5 Report the dimensions of the area that meet the requirements of Section 5.1.

7. Certification

7.1 When specified in the purchase order or contract, the purchaser shall be furnished certification stating samples representing the light source have been tested and inspected as indicated in this specification and the requirements have been met. When specified in the purchase order or contract, a report of the test results shall be furnished. Test reports may be transmitted to the purchaser by electronic services. The content of the electronically transmitted document shall conform to any existing agreement between the purchaser and the seller.

8. Keywords

8.1 coating inspection; fluorescent coatings; fluorescent inspection light

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