



# Standard Practice for Accelerated Testing of the Lightfastness of Ink Jet Prints Exposed to Indoor Fluorescent Lighting and Window-Filtered Daylight<sup>1</sup>

This standard is issued under the fixed designation F1946/F1946M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This practice covers an accelerated procedure intended to screen ink jet prints for lightfastness in office environments where overhead fluorescent light and window-filtered daylight is used for illumination.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.3 *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 Section 8.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

[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](#)

[D3424 Practice for Evaluating the Relative Lightfastness and Weatherability of Printed Matter](#)

[D4674 Practice for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Office Environments](#)

[G113 Terminology Relating to Natural and Artificial Weathering Tests of Nonmetallic Materials](#)

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee F05 on Business Imaging Products and is the direct responsibility of Subcommittee F05.07 on Ink Jet Imaging Products.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto: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 ANSI Standard:

[ANSI/NAPM IT9.9-1996 Stability of Color Photographic Images—Methods of Measuring<sup>3</sup>](#)

## 3. Terminology

### 3.1 Definitions:

3.1.1 *ink jet media*—recording elements used by ink jet printers to receive inks. The substrate may be paper, plastic, canvas, fabric, or other ink receptive material. The substrate may, or may not be, coated with one or more ink receptive layers.

3.2 The definitions given in Terminology [G113](#) are applicable to this practice.

## 4. Summary of Practice

4.1 Printed ink jet media are exposed to radiant energy from an array of 11 very high output (VHO) cool, white fluorescent lamps and, simultaneously, to intermittent energy from two soda-lime glass-filtered fluorescent UV lamps. The extent of UV radiant exposure (nominal UV actinic exposure or UVAE) from both sources is determined separately as the product of UV irradiance at the start of the test and exposure time, in Watt-hours/m<sup>2</sup> (W-h/m<sup>2</sup>).

NOTE 1—The relative spectral power distribution for cool white fluorescent lamps may be found in ANSI/NAPM IT9.9-1996, Table 5.

4.1.1 The contribution of the sunlamp actinic exposure to the total UV actinic exposure is maintained constant by adjusting the on/off cycle time of the sun lamps.

4.1.2 The average nominal sunlamp UV actinic exposure is set at 12 % of the value of for the VHO lamps.

NOTE 2—Most UV exposure results from fluorescent lighting, although some is due to sunlight. The 12 % is an estimate of a representative office environment.

4.2 The duration of the exposure may vary widely depending on the lightfastness of the ink/media.

4.3 During the course of the exposure, the color changes in the printed samples are periodically evaluated either visually or

<sup>3</sup> American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036.